SELWOOD SPATE PD100

Operating & Service Manual

The products of Selwood Limited, are designed, developed and produced in the company's Chandler's Ford factory. Many features are covered by world-wide patents. Product names such as Spate, Simplite and Seltorque, are registered trade marks.

As all products are subject to continuous development, the company reserves the right to alter the specifications and information given in this manual without prior notice.

Whilst every care has been taken in the preparation of this publication the information it contains must not be regarded as binding.

Amendments to this publication will only be issued to cover those design changes which fundamentally alter the build or operation and servicing procedures. They will be distributed through the company's dealers and agencies.

Your attention is drawn to the following symbols used throughout this manual:-

CAUTION
This caution symbol draws attention to special instructions or procedures that, if not correctly followed, may result in damage to, or destruction of equipment.

WARNING
This warning symbol draws attention to special instructions or procedures that, if not strictly observed, may result in personal injury.

WARNING
A WARNING SYMBOL WITH THIS TYPE OF TEXT DRAWS ATTENTION TO SPECIAL INSTRUCTIONS OR PROCEDURES WHICH, IF NOT STRICTLY OBSERVED MAY RESULT IN SEVERE PERSONAL INJURY, OR LOSS OF LIFE.

Additional copies of this manual are available from Selwood Pt No 0408024000

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Additional copies of this manual may be ordered from Selwood Limited by quoting the publication number shown on the outside back cover.

REPLACEMENT PARTS

Instructions for Ordering

1. Always quote the pump serial number located on the plate fastened to the pump.
2. Always quote the ten digit part number for the component, not the item reference number.
3. Always quote the description of the component.

Items usually supplied together as sub-assemblies, will have the sub-assembly part number printed at the bottom of the relevant page.

HEALTH AND SAFETY AT WORK

April 1975

As manufacturers of pumps and associated equipment we wish to inform you that, in compliance with Section 6 of the Act, safety precautions should be taken with certain of our products.

We take every care to ensure as is reasonably practicable that our products are safe and without risk to health when properly used. Nevertheless, appropriate health and safety precautions must be taken, and in particular you are requested to have special regard to the operational and safety requirements leaflet P769 which accompanies each pump on despatch from our premises.

Our products also conform to the E.E.C. Machinery Safety Directive and carry the C.E. mark.

CALIFORNIA USA PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

WARNING

Pumps and engines may be fitted with seals or 'O' rings manufactured from **VITON** or similar material.

When temperatures reach 400°C (720°F) a corrosive acid is produced, which cannot be removed from the skin.

If signs of material decomposition are evident, or if in doubt, **always wear disposable heavy-duty gloves**.

SAFETY PRECAUTIONS

WARNING

ALL ITEMS IN THIS SECTION, IF NOT STRICTLY OBSERVED, COULD RESULT IN SEVERE PERSONAL INJURY OR LOSS OF LIFE.

1. Use only lifting equipment of suitable capacity for the size and weight of the equipment being lifted
2. The equipment must always be lifted using safe working practices and in accordance with any local and national guidelines or statutes. If in doubt, consult Selwood Pumps or a local lifting expert.
3. Whilst lifting the unit keep personnel well away and ***never*** allow people underneath.
4. Personnel working on the pump must always wear clean, correctly fitting clothing and safety footwear. Clothing impregnated with oil or fuel can constitute a health hazard through prolonged contact with the skin and may also constitute a fire hazard.
5. Check the type of liquid that the pump has been employed on before working on them. Residues could be hazardous to your health. If in doubt, flush thoroughly with clean water before commencing work.
6. Rotating equipment presents a hazard in itself. Alert surrounding personnel before starting and post notifications whilst in operation.
7. Moving parts are guarded to protect you. Guards removed for maintenance must be replaced before starting the pump.
8. Never insert anything into the pump body whilst the pump is running and the suction or delivery hoses are disconnected.
9. Use all flange bolt holes and ensure the correct bolt size and quality is utilised when connecting suction and delivery hoses.
10. Collapsible hoses must never be used on the suction side of the pump.
11. Keep the hose end suction area free from debris. Although the pump can handle solids up to the size indicated in the Technical Data section of this manual, larger or irregular solids may cause blockage with damage to pump components.
12. Always allow adequate ventilation for the pump driver. Diesel engines require air for both combustion and cooling. This air must never be allowed to re-circulate.
13. Be aware of burn and fire risks from items such as exhaust pipes and silencers. Never place flammable items around the unit.
14. Liquid pressure may still be present even after shutdown of the pump. Particular attention should be paid to delivery lines that are long, or rise through any height, as these can contain large volumes of liquid. These lines must be isolated and drained down before commencing work. Sudden release of this liquid can cause serious injury to an operator either directly or indirectly through the rotational motion it can induce.

WARNING! Delivery hose and any associated pipe work should be capable of withstanding the maximum system operating pressure. Selwood recommend the minimum pressure rating of 3Bar hose. Suction hose should be of the non-collapsible variety.

WARNING! The pump should only be operated within the speed and pressure limits detailed in Section 1.6 of this manual.

1. If there is a danger of freezing, the fluid, normally retained within the pump between operating cycles, should be drained off through the drain taps provided.
2. **WARNING!** Never start or run the pump against a closed delivery valve. Failure to comply may result in damage to the unit or personal injury.
3. **WARNING!** Noise level at operator position (Start Panel) may exceed 80dB(A). Hearing protection must be worn at all times when the unit is running. Failure to comply may result in hearing damage or loss.

SELWOOD SPATE PD100

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1 GENERAL INFORMATION

1.1 Installation

1. The pump unit and its associated baseplate or trolley mounting should be positioned on a firm horizontal platform, and in the case of portable units restrained from accidental movement.
2. If the pump is fitted with push-on type suction and delivery spigots the hoses must be firmly secured on these spigots with heavy duty clamps or clips capable of withstanding the system operating pressure. The integrity of the hose clamping arrangements should be checked at regular daily intervals in the case of static installations or whenever the pump is repositioned in the case of portable units. Similar precautions should be taken with clamps securing multiple lengths of hose on installation where long delivery and suction lines are involved.
3. Delivery hose and any associated pipework should be capable of withstanding the maximum system operating pressure. Suction hose should be of non-collapsible variety. Where used with rigid pipework at least 2M of flexible pipe should be used on both suction and delivery connections.

1.2 Operation

1. **CAUTION** The pump should only be operated within the speed and pressure limits detailed in the operating handbook for the model in question.
2. If there is a danger of freezing, the fluid normally retained within the pump between operating cycles should be drained off through the drain taps provided.
3. **WARNING** Positive displacement pumps of the PD100 type should not be run against a closed valve on the delivery side. If there is a danger of high system pressures developing because of closed delivery valves or some other reasons the pump should be fitted with a full flow relief valve adjusted to a lift at a safe working pressure for the pump and pipework system.
4. Where protective caps are used to prevent damage to the suction and delivery spigots during storage or in transit they must be removed before the pump is started up.

1.3 Maintenance

1. Inspection and maintenance. Regular flushing after use and periodic stripping and inspection of the cylinders will help maintain the PD100 in best condition. All bearings are sealed for life so lubrication is only necessary when re assembly of the pistons to the connecting rods occurs. See lubrication section for advice on products and brands. Appropriate flushing with clean water after use will further aid long service life. The engine or driver should be maintained in accordance with the manufacturer's instructions.
2. Replacement parts. Only the manufacturers or factory approved components should be used as replacement parts and where necessary they should be fitted with the assistance of the special purpose tools indicated in the operating and servicing manual.
3. All maintenance work must be carried out with the pump and engine/motor stationary.

1.4 I.C. Engines

1. Where I.C. engines are used to power the pump they have been mounted in accordance with the engine manufacturers recommendations and adequate guarding provided between the pump and engine.
2. **Exhaust and Exhaust Pipes.** if there is a risk of accidental contact by operators, the exhaust system should be lagged or screened and the outlet directed away from operators or other persons likely to be nearby. Direct contact with flammable materials of all types must be avoided. The importance of adequate ventilation to ensure removal of exhaust fumes when engines are operated in enclosed or covered accommodation cannot be overstressed. Engines should not be run in hazardous explosive atmospheres.
3. **Access and Operation.** Ensure that the operator can start, control and stop the engine easily by making all controls readily accessible. Fit remote controls if access is difficult. Follow the instructions laid down in the engine manufacturer's Operators Handbook for starling, operating and stopping procedures.
4. **Fuel.** In addition to the fire hazard associated with fuel and lubricating oils, preventative action is necessary with respect to leakage, contamination and bodily contact.
5. **WARNING Electrical Connections.** It is essential that earth terminals are connected with an absolutely sound earth point and care should be taken to ensure that the correct sized conductors are selected to suit the current and distance it is to be carried.

1.5 Electric Motors

1. All electrical connections should be made with adequately rated conductors and starters. Isolators and other associated switchgear should be of adequate capacity for the imposed power loadings. All electrical equipment should be adequately earthed. All connections to be made by a qualified electrician to BS7671 latest revision.
2. **WARNING** Isolate the power supply before carrying out any commissioning, servicing

or maintenance work on the pump or electric motor.

3. Where electric motors are to be operated in hazardous or explosive atmospheres they should be of the flameproof enclosure type appropriate to that atmosphere.

You are requested to take such steps as are necessary to ensure that this information is made available to all those involved with the use of our products. This information must be made available not only to your own employees at their workplace, but also to anyone who may purchase or otherwise acquire (hire) such products for use in his own workplace.

It is our intention constantly to review our obligations under the Act and we will be issuing from time to time further information with regard to the safe application, use, inspection, and service associated with our products.

1.6 Spate PD100 Standard Data

Maximum Output	90.9M^3/h 20,000UK gal/h
Maximum Suction Lift	9.1m 30ft
Self Priming Lift	8.5m H_20 28ft H_20
Maximum Head	21.3m 70ft
Maximum Solids Size	16mm 0.62in
Air Handling Capacity	11.8l/s 25.0ft^3/min
Pump Speed at max head m	1000rpm - 23.0m 1100rpm - 12.2m
Port Size Spigot	100mm 4in

2 ROUTINE MAINTENANCE

Lack of routine maintenance is the most frequent reason for the breakdown of pumps. We earnestly advise users to ensure that at least the following actions are taken.

1. Check these oil levels daily:
   a) Engine oil.
   b) Gearbox oil chamber.
2. In cold weather, when there is a possibility of frost, always drain water from the pump particularly where the pump may experience long periods of inactivity. During these conditions, drain the following areas:
   a) Pump body.
   b) Delivery manifold and pipework.

CAUTION

Failure to drain the pump body and delivery line in these conditions could result in the pumped product residue freezing and cracking the casing and manifold.

3. Do NOT run the pump if significant quantities of water escape through the bearing frame drain hole. This indicates failure of the inner neck seal and must be repaired before running can continue. Refer to servicing instructions for further advice.
4. Do NOT run the pump if malfunction is suspected in any of its parts.
5. A hose strainer should always be fitted to the free end of the suction line if there is a possibility of oversized solids entering the pump. The dimensions of rocks, pebbles, etc. must not exceed 16mm Refer to Selwood Ltd if in need of advice in this connection.
6. As loss of prime and indeed loss of on-stream performance can easily arise as the result of leaking pipework joints, we recommend that all line fittings associated with the pump should be checked periodically for air-tightness.
7. It is most Important to use the correct fuel oil in the engine. Make sure that it is appropriate for the weather conditions (summer or winter) and that it is clean and free from water and foreign matter. Unsatisfactory running performance, excessive wear and damage can all result from the use of Incorrect or contaminated fuel.
8. Periodically check the tension of all nuts and bolts, especially those securing the engine and pump to the chassis.
9. Pump servicing must always be carried out in accordance with the instructions given in this manual. Only components supplied and approved by Selwood Ltd should be used. It is advisable to hold a small stock of spare parts to cover breakdown circumstances. The Company will be pleased to give advice in this connection.
10. Engine servicing must always be carried out in accordance with the instructions given in the manufacturer's manual. Do not hesitate to contact Selwood Ltd if the need for further advice arises.
11. Please contact Selwood Ltd in the event of experiencing difficulty when servicing. The company will also be very pleased to give advice in connection with the machine's installation, operation and maintenance.
12. All practical work must be carried out in compliance with the Health and Safety at Work Act, 1975. Always start the engine in accordance with the manufacturer's instructions.

NOTE: If the above advice is followed, the likelihood of an expensive break down will be greatly diminished. The pump should give a long and trouble free life if these measures are put into effect.

3 LUBRICATION AND FASTENING TORQUES

Pump Lubrication

It is most important to maintain the correct levels of oil in the seal chamber and bearing housing, and to ensure that the oil is of the recommended quality and is free from contamination. Selwood recommend the use of the following Shell products, which should be applied as per the following table. In some territories, the following grades may be known under differing trade names, please contact Selwood if problems occur in identifying the correct product.

COMPONENT	SHELL GRADE	BP grade
Engine Lombardini LDW702	Rimula X 15W-40	Vanellus C5 Global
2:1 Gearbox	Spirax A 80w-90	Energear Hypo 80W-90
Bearing housing	Alvania EP LF 2	Energrease LS-EP2
Actuator Bore	Ensis SDB	Castrol Rustilo

COMPARTMENT	DRAIN INTERVAL	
	HOURS	MONTHS
Engine Sump	250	
2:1 Gearbox		12
Bearing housing	ON ASSEMBLY	
Actuator Bore	ON ASSEMBLY	
Paper Gaskets	ON ASSEMBLY	

4 INSTALLATION, COMMISSIONING & OPERATION

4.1 Installation

1. The pump unit and its associated base plate or trolley mounting should be positioned on a firm horizontal platform, and in the case of portable units restrained from accidental movement.
2. If the pump is fitted with push-on type suction and delivery spigots the hoses must be firmly secured on these spigots with heavy duty clamps or clips capable of withstanding the system operating pressure. The integrity of the hose clamping arrangements should be checked at regular daily intervals in the case of static installations or whenever the pump is repositioned in the case of portable units. Similar precautions should be taken with clamps securing multiple lengths of hose on installations where long delivery and suction lines are involved.
3. Ensure that rigid hose is used on the suction and that the discharge hose has a minimum working pressure of 20psi.
4. Ensure that the suction strainer is fully submerged.

4.2 Operation

1. The pump should only be operated within the speed and pressure limits detailed in the operating handbook for the model in question.
2. If there is a danger of freezing, the fluid normally retained within the pump between operating cycles should be drained off through the drain taps provided.
3. Positive displacement pumps of the PD100 type should not be run against a closed valve on the delivery side. If there is a danger of high system pressures developing because of closed delivery valves or some other reasons, the pump should be fitted with a full flow relief valve adjusted to lift at a safe working pressure for the pump and pipework system.
4. Where protective caps are used to prevent damage to the suction and delivery spigots during storage or in transit they must be removed before the pump is started up.

4.2.1 Commissioning Period

Drain the pump chamber and engine within 100 running hours of commissioning either a new, or rebuilt unit, and refill with new oil to correct level.

4.2.2 After Commissioning Period

If the pump is driven by a diesel engine, the oil should be drained and renewed in line with the time schedule laid down by the engine manufacturer. This will usually require the oil to be drained and replaced every 250 running hours. Under no circumstances should the period exceed 500 running hours.

4.3 Fastening Torques

Failure to tighten threaded fasteners correctly can easily lead to assembly breakdown. It is very important, therefore, when carrying out the instructions in this manual, to achieve the appropriate tensioning torques. In some cases, specific requirements are described in the instructions, which must always be implemented. The following torques, in particular, must be applied.

Item	Tightening Torques	
	lbft	kgf m
M16 Fixings	180	25
Actuator nut 0015975000	80	11
Cylinder head nuts	80	11

5 CONDITIONS OF WARRANTY

For a period of twelve months from delivery of any Selwood pump to the first user thereof, or eighteen months from the despatch of any such pump by Selwood, whichever period is the shorter, Selwood will repair or, at its option, replace any component, which in the opinion of Selwood has failed due to defective workmanship or materials.

For full terms and conditions please contact Selwood Ltd.

6 GENERAL OPERATION

6.1 Self Priming

In normal practice, the Spate PD100 pump remains primed after initial use, even when the hoses are removed and it is out of service. When priming a new pump, or after draining for any reason, maximum self-prime lift of 8.5/9.1m (28/30ft) will only be obtained if the flood prime manifold is filled with water through the delivery connection, or if fluid is introduced through the suction spigot with the pump running.

Suction lifts and hoses should be kept as short as possible to avoid cavitation.

6.2 The Suction Strainer

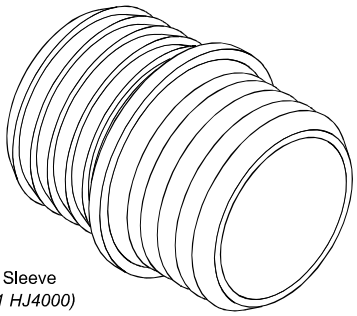
Always use the high capacity Spate hose strainer supplied with the pump. Make sure that it is firmly secured to the suction hose by using heavy duty clamps or clips illustrated. Failure to secure the strainer firmly may result in its loss and consequential blockage of the hose and pump by excessive solids.

6.3 Securing and Joining Hoses

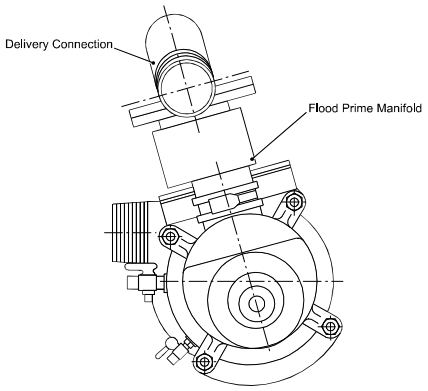
The pump is fitted with push-on type suction and delivery spigots and the hoses must be firmly secured to these spigots with heavy duty clamps or clips.

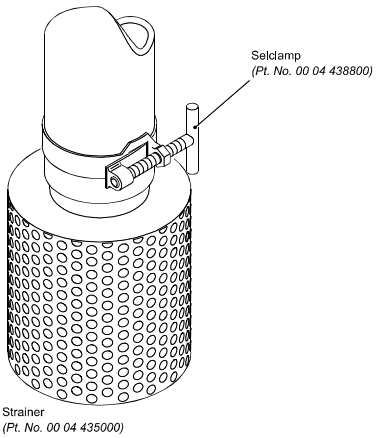
When pumping at high pressure, to high heads or compressing air, the SELCLAMP (Patented) heavy duty hose clamp which is designed to withstand pressures up to 6.91bar (100psi) is recommended. The clamp can be hand tightened and does not require tools.

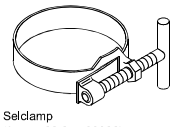
Hoses of various lengths can be joined together by the push-on method using hose joint sleeves which should be firmly clamped to avoid leakages, particularly in the suction hose.



Hose Joining Sleeve
(Pt. No. 90 01 HJ4000)





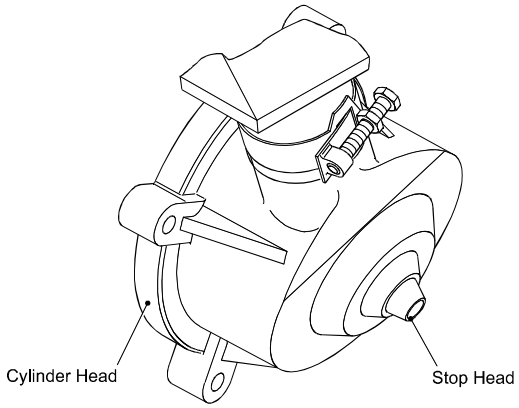


6.4 Oil Handling

In the Spate PD100 Pump, the seals and valves are in synthetic elastomer, developed to have exceptionally long fatigue lives and are suitable for handling continuously, lubricating oil, fuel oils and greases of most types without chemical deterioration. If in doubt ask.

The compression regulator is an internal type, integral with the cylinder head and is completely oil resistant and not subject to abrasive wear.

The stop head outside the cylinder head will be seen to move as the pumping pressure increases. This is a normal function and no adjustment is necessary.



6.5 Abrasives

In the Spate patented design, the absence of sliding seals allow sand in suspension to be handled with a minimum of abrasive wear, and there are no metal to metal clearances of less than 16mm (5/8"). The thickest known flowable materials may be pumped. The pump is made from a special aluminium silicon alloy which is more resistant to sea-water than most cast irons and far more resistant to impact damage. Internal flow speeds being low and clearances large; there is no tendency for high abrasive wear.

6.6 High Pressure and Jetting

Delivery pressures up to 2.1bar (30psi) or 21.3m (70ft) water head may be pumped. For jetting in wellpoints, water pressures up to 3.4bar (50psi) may be applied for short periods. With high water pressures and high air capacity of 11.8l/s (25cfm) the pump is ideal for wellpoint de-watering - jetting and operating the wellpoints.

6.7 Frost and Ice

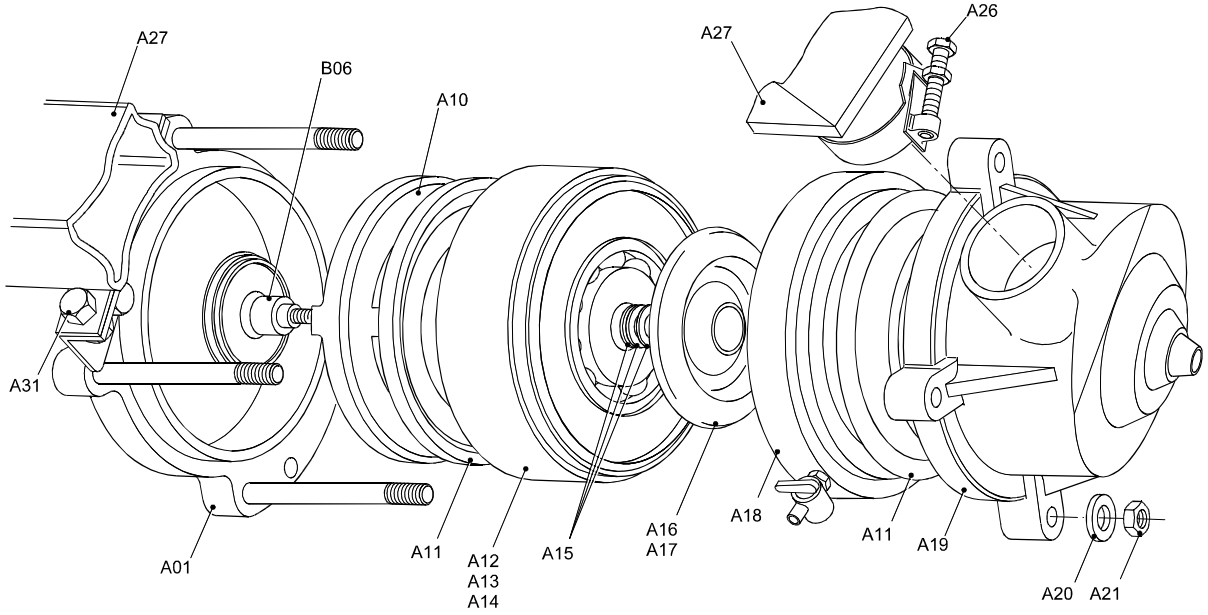
To prevent ice damage in cold weather remove the suction and delivery hoses, open the drain taps in the

Pump cylinders and continue to run the pump until all water has been expelled.

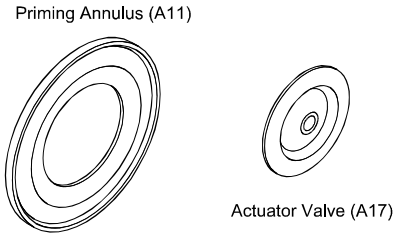
7 FIELD SERVICING

7.1 Dismantle Pump Cylinder

1. Slacken the flood prime manifold connector clamp (A26) and undo the four flood prime manifold securing bolts (A31). Remove the flood prime manifold (A27)
2. Remove the pump cylinder head nuts (A21) and the cylinder head (A19).
3. Remove the outer priming annulus (A11) and delivery port plate (A18).
4. Remove the actuator nut (A16) with actuator valve (A17).
5. Remove the three actuator washers (A15) from the connecting rod (A38).
6. Remove the cylinder ring (A12) complete with the actuator (A14) and actuator seal (A13) assembly. Take care not to lose the connecting rod collar (B06) which may come away with the actuator.
7. Remove the inner priming annulus (A11) and suction port plate (A10).
8. Clean and inspect the connecting rod cylinder Seal (A05) but do not remove it unless it needs to be replaced.
9. Before re-assembly wash all the components and assemble wet. Check that the 11mm (7/16") diameter flood prime hole in the delivery port plate (A18) is clear and that the drain tap is not blocked. Ensure that the three actuator washers are replaced with the apex of the coned washers towards the actuator nut. Grease the thread of the actuator nut (A16) replace and tighten the nut to the recommended torque of 108.5Nm (80lb.ft).



7.2 Examination and Replacement of Flexible Components



These flexible mouldings of synthetic rubber are oil resisting and are not expected to fail in normal use.

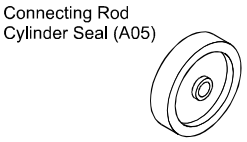
Look for splits due to excess pressure or distortion due to chemical contamination. Each priming annulus must be a free fit in the cylinder ring and cylinder head recess.

7.2.1 Priming Annulus (A11)

Replacement

1. Re-assemble these parts wet if possible.
2. Turn each priming annulus over to improve its seating.

7.2.2 Connecting Rod Cylinder Seal (A50)

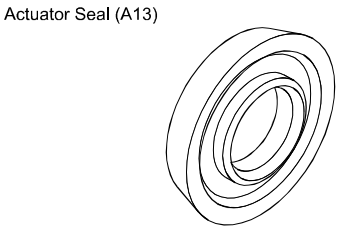


These seals are synthetic rubber mouldings, oil resisting and with long use may develop cracks around the inner neck diameter. When these have grown to half to three-quarters of the original thickness the seals should be replaced. The pump should not be operated for any long period with failed seals. Radial cracks in the seals can be ignored. It is advisable to replace both Connecting rod cylinder seals at the same overhaul period.

Replacement

1. Remove the connecting rod collar (B06) and prise the old seals out of their housings. Position the pump connecting rod out as far as it will go by rotating the engine flywheel. (This is very important).
2. Use soft soap to lubricate the connecting rod cylinder seal and push on to the connecting rod, at the same time assisting the entry of the outer edge with a blunt screwdriver.
3. When the centre of the seal is located into recess on the connecting rod, the outer edge can be firmly positioned with a hide hammer or similar tool.

7.2.3 Actuator Seal (A13)



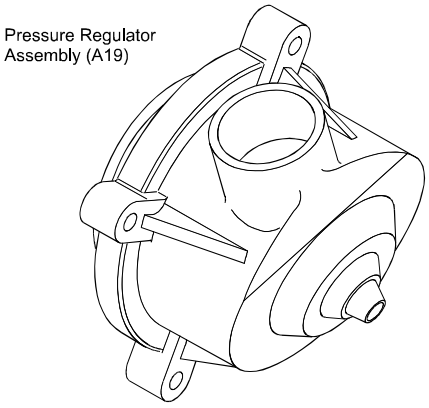
These seals are oil resisting synthetic rubber mouldings. Over a long wear life cracks develop around the inside neck recess, but the seals need replacement only when half to three-quarters of the original moulded thickness is separated. It is advisable to replace both Actuator Seals at the same overhaul period. Inspect con rod cyl seals at this time and replace if required

Replacement

1. Press the inner flange of the seal completely into the Actuator.
2. Wet the outer flange and press it into the cylinder ring, making sure that all mating surfaces are clean and free from grit.
3. Replace the three actuator spring washers, Actuator and actuator nut, tightening the actuator nut completely.

It is very important that this joint should be completely re-tightened to the recommended torque of 108.5Nrn (80lb.ft). Failure to tighten sufficiently may result in wear of the connecting rod and actuator centre. If this wear takes place these components must be replaced.

7.2.4 Pressure Regulator Assembly (A19)



The compression regulator is an internal type, integral with the cylinder head and is completely oil resistant and subject to the minimum of abrasive wear.

The stop head outside the cylinder head will be seen to move as the pumping pressure increases. This is normal function and no adjustment is necessary.

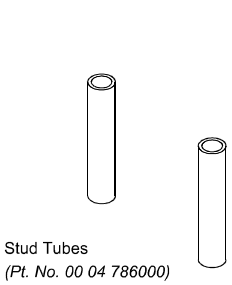
8 WORKSHOP SERVICING

8.1 Dismantle Pump Drive Mechanism

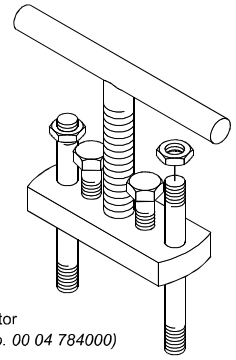
NOTES:

1. Maximum pressure loading on Assembly not more than 3 tons. On dismantling the initial force to move Eccentric Shaft through Bearings etc. is approximately 20 tons loading.
2. Hydraulic Press. Minimum height between the press body and the Operating plunger of the press must be 610mm (24").

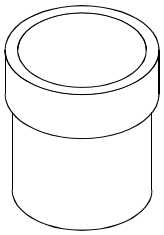
4. Remove the Flood Prime Manifold (A27) and dismantle both Pump Cylinders as described in "Field Servicing".
5. Remove transmission guards E08 and E09 by releasing fittings E13, E14 and E15.
6. Release taper lock bush E01 and remove fixings F09, F15 and F34 attaching the pump body A01 to the pump mounting plates F31 and F32.
7. Lift and withdraw pump body together with the extension drive shaft assembly from the tyre coupling and carefully stand it on its side on the four cylinder studs.
8. Release fixings B15, B16 and B17 and withdraw the extension drive shaft assembly at the half coupling B13/B09. Retain the coupling rubbers B11 if serviceable, otherwise replace with new.
9. Rotate the Eccentric Drive Shaft so that the uppermost Connecting Rod Cylinder Seal (A05) is fully extended.
10. Slide off the Connecting Rod Cylinder Seal Collar (B06) and prise out the Connecting Rod Cylinder Seal (A05) with suitable lever, such as a screwdriver, and repeat the previous operation to remove the second Cylinder Seal by inverting the Pump Body.
11. Remove the Rubber Body Plug (3) located below the Pump Suction Spigot.
12. Remove the Pump Half Coupling (B09) with the Extractor (Pt No. 0004784000) using the two 3" x 1/2" Whitworth bolts supplied.
13. Screw the two spare Cylinder Studs (A04) into the Main Bearing Housing (B08). Put a washer (A20) over each of the Cylinder Studs to prevent the stud tube entering the recess in the Bearing Housing (B08), then slide the Stud Tube (Pt No. 0004786000) over each Stud. Attach the Extractor Tool (Pt No. 0004784000) to the Cylinder Studs, secure with the 5/8" Whitworth nuts supplied and withdraw the Main Bearing Housing.
14. Place the Support Tube Tool (Pt No. 0004792000) on to the press table with the flange uppermost. Place the Pump Body with the Suction Spigot upwards over the Support Tube Tool so that it supports the Connecting Rod Bearing (B04). Press out the Eccentric Drive Shaft (B03) using the stem of the Press Tool (Pt No. 0004785000) through the hole in front of the Suction Spigot.
15. Remove the Pump Body from the press table and take out the loose Eccentric Drive Shaft (B03) Connecting Rod Assemblies (B04 and B05), and Spacer (B07) and the Rear Main Bearing Spacer (B02). Remove the Support Tube (Pt No. 0004792000) from the press table.
16. If required, press out the Rear Main Bearing (B01) using the stem end of the Press Tool (Pt No. 0004785000) and a steel bar 88mm x 12.7mm (3"x 1/2") minimum 9.5mm (3/8"). Only remove this Bearing if damaged and in need of replacement.
17. The Front Main Bearing (B01) which has been removed with the Eccentric Drive Shaft (B03) can now be drawn off with a suitable claw extractor.



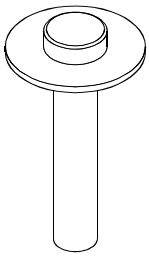
Stud Tubes
(Pt. No. 00 04 786000)



Extractor
(Pt. No. 00 04 784000)



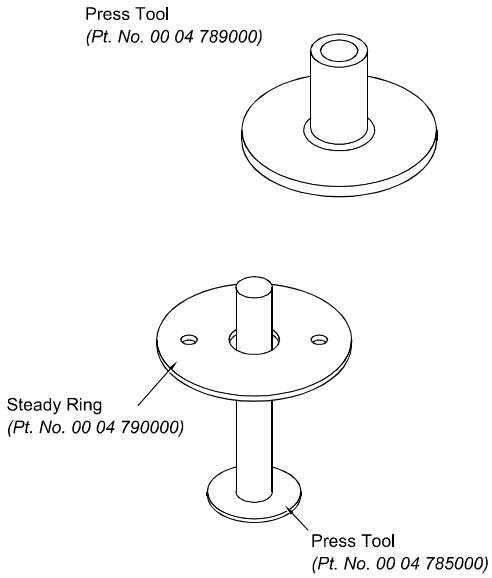
Support Tube
(Pt. No. 00 04 792000)



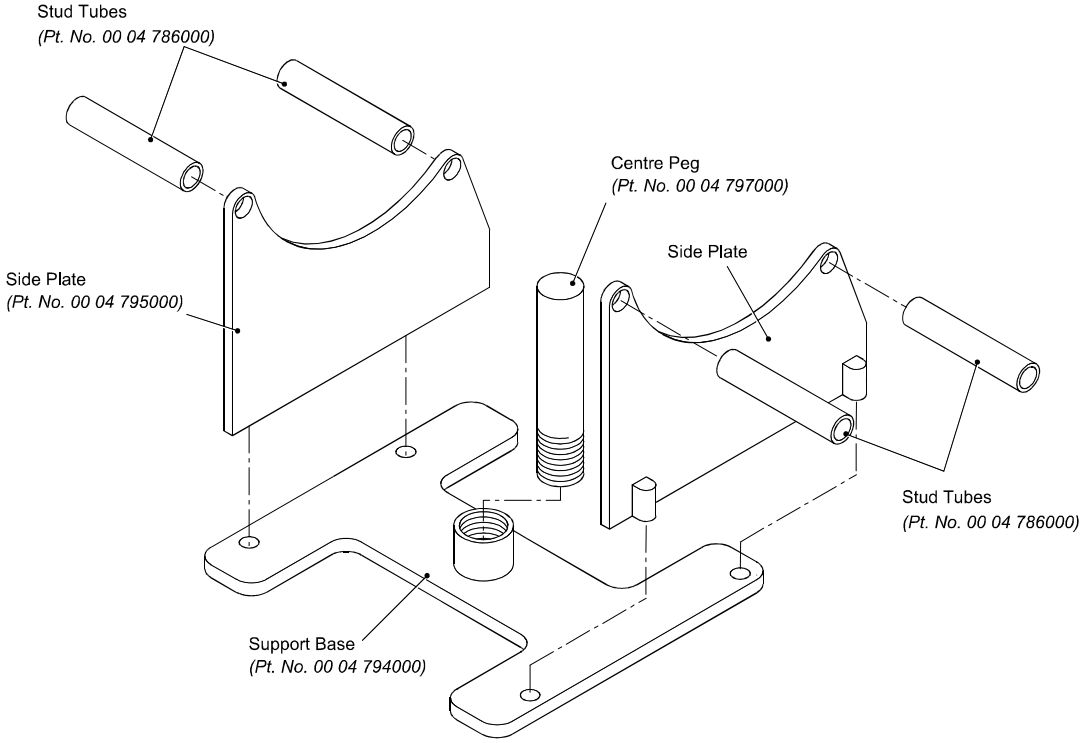
Press Tool
(Pt. No. 00 04 78500)

8.2 Assemble Pump Driver Mechanism

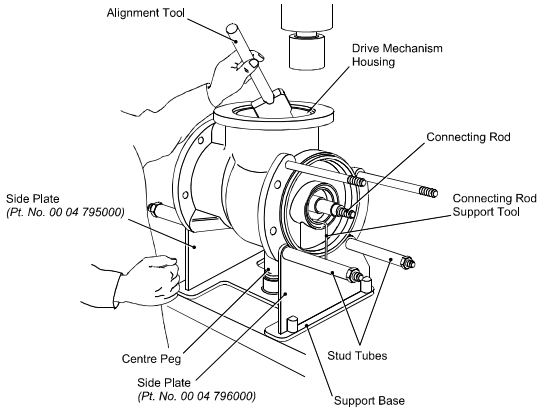
1. Using the press tool (pt no. 0004785000) assemble the connecting rod bearings (B04) into the connecting rods (B05).
2. Press the main bearing (B01) into the main bearing housing (B08) using press tool (Pt No. 0004789000).



3. Attach the sideplates (Pt No. 0004795000) and (Pt No. 0004796000) to the pump body by sliding them on to the pump body cylinder studs (A04) ensuring that the location pins on the bottom edge of the sideplates are facing away from the pump body and pointing in the same direction as the pump's suction spigot. (The angled edge of the sideplate must be towards the suction spigot). Place the stud tubes (Pt No. 0004786000) on to the cylinder studs (A04) to act as spacers and secure with the cylinder head nuts (A21).
4. Screw the centre peg (Pt No. 0004797000) into the centre of the support base (Pt No. 0004794000) to its lowest point. Lift the pump body with the attached sideplates on to the support base with the pump suction spigot facing down locating the sideplate pins into the holes in the support base, and the centre peg into the hole below the pump's suction spigot. The pump suction spigot should be away from the operator for the assembly of the drive mechanism into the drive mechanism housing.

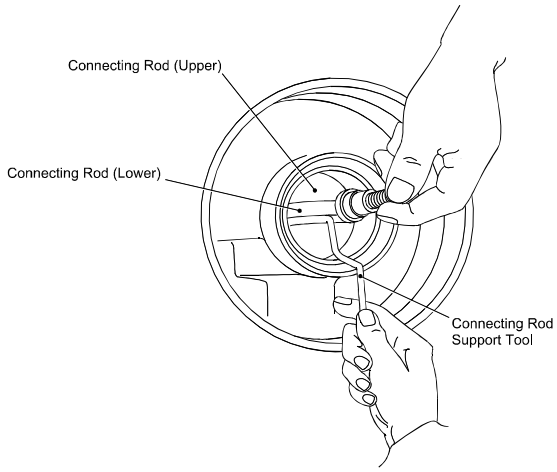


5. Place the rear main bearing (B01) over the bearing recess; in the drive mechanism housing position press tool (Pt No. 0004785000) into the bearing, place press tool (Pt No 0004789000 over and down the stem of press tool (Pt No. 0004785000) until it locates on the ledge in the mechanism housing. Press in main bearing until it butts with the bottom of the bearing recess in the pump body. Remove tools.
6. Position the rear main bearing spacer (B02) on to the main bearing with the chamfered edge downwards and against the bearing.
7. Insert a connecting rod assembly for the right hand (lower) pump cylinder on top of the bearing spacer but approximately 9.5mm (3/8") off centre towards the right hand cylinder.
8. Place the connecting rod spacer (B07) onto the positioned connecting rod.
9. Insert and position the second (left hand) connecting rod assembly over the lower (right hand) connecting rod and spacer 9.5mm (3/8") off centre towards the right hand cylinder so that both connecting rods are aligned. Hold in position by hand. Insert the alignment tool (Pt No. 0004782000) through the connecting rod bearing spacers and rear main bearings.
10. Leaving the alignment tool in position, insert the connecting rod support tool (Pt No. 0004798000) through the right hand (lower) pump body connecting rod/cylinder seal boss so that it bears between the top of the rear main bearing and the outer race of the (lower) connecting rod bearing.
11. With all assembled parts correctly aligned, carefully remove the alignment tool and with equal care insert the eccentric shaft (B03) (short shaft end first) through the uppermost connecting rod bearing. press the eccentric shaft until it is fully home and remove the support tool (Pt No. 0004798000). The connecting rods should now be within 0.75 to 1.0mm of the centre in each connecting rod seal housing in the pump body casting.
12. Extend the centre peg (Pt No. 0004797000) in the support base by screwing it up until it firmly rests under the end of the positioned eccentric shaft.
13. Fill the mechanism housing with a suitable lithium based high melt point grease (Shell Alvania 3, suitable for the United Kingdom and similar climates) to the level of the upper surface of the uppermost connecting rod.



Position of the Pump Body for the insertion of the drive mechanism assembly.

NOTE: The pumps suction spigot is away from the assembler for the complete assembly operation.



Positioning for the Connecting Rod Support Tool

Carefully position the front main bearing housing assembly (B01 and B08) on to the eccentric shaft, ensuring that one of the two slots in its outer edge is in line with the drain hole in the pump body casting.

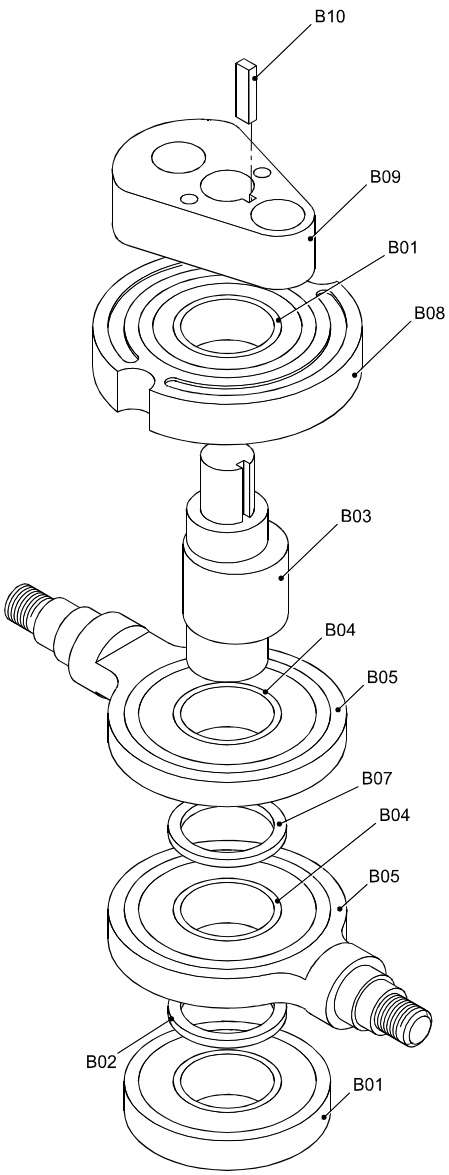
14. Place the press tool (P1: No. 0004789000) on to the housing assembly and with the steady ring (Pt No. 0004790000) placed down its stem, press in the housing assembly until the bearing butts with the shoulder on the eccentric shaft. Remove tools.
15. Place the pump half coupling (B09), raised boss down, onto the end of the eccentric shaft, lining up the keyway. Press onto the shaft with press tool (Pt No. 0004789000) until the uppermost surface of the coupling and Shaft are flush and insert half coupling key (B10).
16. Remove pump from support base and put sufficient grease of the same specification as used in the mechanism housing (see instruction 13) into hole below the pump's suction spigot and insert rubber body plug (A03).
17. The drive mechanism is now complete and ready for re-coupling with the extension drive shaft assembly and attachment to the mounting brackets. Make sure that the coupling rubbers are in place and that all fixings are torqued correctly.

NOTES:

1. Maximum pressure loading on assembly not more than 3 tons. On dismantling the initial force to move eccentric shaft through bearings etc. is approximately 20 tons loading.
2. Hydraulic Press. Minimum height between the press body and the operating plunger of the press must be 610mm (24").

Tool List

Part Number	Description	Number
0004782000	Alignment Tool	1
0004784000	Extractor	1
0004785000	Press Tool	1
0004786000	Stud Tubes	4
0004789000	Press Tool	1
0004790000	Steady Ring	1
0004792000	Support Tube	1
0004794000	Support Base	1
0004795000	Side Plate	1
0004796000	Side Plate	1
0004797000	Centre Peg	1
0004798000	Connecting Rod Support Tool	1
0004440000	Cylinder Studs	2
0004412000	Nuts for Studs	2
	Bolts ½" BSW x 3"lg	2



The drive mechanism components in order of assembly into the pump body (lowest illustration (B01) first.

9 FAULT FINDING GUIDE

Proceed in the sequence in which the Actions are given.

PUMP WILL NOT PRIME, OR LOSES PRIME HAVING PUMPED PRODUCT FOR A BRIEF PERIOD OF TIME

ACTION		COMMENT
1	Check that pumping chambers contain liquid.	The pump's priming ability will be greatly increased if the chambers are filled.
2	Check that duty lift does not exceed pump's standard capability.	This pump is capable of priming to a maximum vertical height of 8.5m (28ft) H_20.
3	(a) Check all suction-side hoses, fittings and joints for air leaks.	Priming problems are VERY often caused by faults in supply pipework. Air must NOT be allowed to pass into the system across couplings, etc.
	(b) Check strainer and suction hose for blockages.	Do not use un-reinforced hose. Always fit a strainer of correct size and type either to the submerged end of the hose, or into the pump's suction spigot. Selwood Ltd provide special strainers for this purpose - they are easy to clean but difficult to remove.
4	Check product viscosity.	As viscosity rises, pump speed must be reduced. Refer to Selwood Ltd for advice in connection with specific fluid and duty requirements.
5	Check for solids trapped beneath valves and also for damaged valve seats.	Occasionally, solids become trapped and so prevent the valves sealing. Fluids containing a high proportion of abrasive solids can cause seat erosion which likewise impairs valve efficiency.
6	Check condition of annular valves.	Contact with non-permitted chemicals can sometimes cause the rubber to swell. When at rest, the valves should contact their seats.
7	Check condition of actuator and connecting rod seals.	These components guide the actuator, and also seal the pumping chambers. It is essential that they should not be split or perforated in any way.
8	Check pump castings for holes, splits or porosity.	Fluids containing a high percentage of abrasive solids can lead to severe erosion of the passageways.
9	Check for air leaks across cylinder rings.	The actuator seal and priming annulli have sections of rubber that seal the cylinder rings. Damage to a ring's sealing surfaces during fitting, for example, can lead to leakage of air into the pump's chambers.
10	Check that actuators reciprocate freely when pump shaft is turned.	Bearing failure might result in inadequate displacement. However, as the bearings are generously-sized this situation is unlikely to arise.
11	Check that drain tap is not open.	Drain taps are sometimes left open overnight.

OUTPUT AND HEAD ARE LESS THAN PUBLISHED FIGURES

ACTION		COMMENT
1	Check strainer and suction pipework for blockages. Also check that air is not being pulled through a vortex created in the supply reservoir.	Choking of the supply system by solids will increase the flow resistance, thus increasing the head against which the pump has to operate, and reducing output. Entry of air through faulty pipe joints will have a similar effect. Reduction also occurs if air is entrained through a vortex - to eliminate, increase strainer's submergence.
2	Check sizes of suction and delivery hoses.	Use wire-reinforced hose for suction system. Length should be minimised and pump sited as close to supply reservoir as possible. Unnecessary bends and fittings should not be incorporated in either the suction or delivery pipework systems. Stop valves downstream of the pump must never be closed when pump is running.
3	Check condition of annular valves and flexing seals.	When at rest, the priming annuli should touch their seats. Flexing seals should be free from cracks and perforations.
4	Check for solids trapped in pump body and manifold.	Blockages are most unlikely to occur if the correct strainer is fitted.
5	Check pump speed.	Normal operating pump speed is 1000 rev/min.

FLUID ESCAPING FROM PUMP UNIT

ACTION		COMMENT
1	If fluid is leaking from drain hole in body, check condition of connecting rod seal.	The pump should not be run in this condition. Immediately replace seal if examination reveals a split component.
2	Failure of the pressure regulator seal in the cylinder head indicated by leakage around the stop end.	Complete replacement of the cylinder head is necessary as the pressure regulator is an integral assembly within.
3	If fluid is leaking from manifold connectors, tighten clips and check delivery pressure.	Delivery pressure must not exceed 21.3m (70ft).

PUMP IS UNEXPECTEDLY NOISY

ACTION		COMMENT
1	Check that noise does not emanate from engine, chassis or tank.	Loose fasteners, particularly those associated with the tow bar, can give rise to unexpected noises.
2	Check that there is at least 2m of flexible hose connected to the suction and discharge spigots.	Pump can be used for rigid-pipework installations provided that they incorporate these two lengths of hose.
3	Check that maximum fluid pressures are not being exceeded.	See Fluid Escaping from Pump Unit Action 3 for maximum delivery heads.
4	Check that duty suction lift is not excessive.	In some circumstances, lifts over 5.5m (18ft) H_20, can cause water-hammer problems in manifold.
5	Check that pump speed is not too high.	Refer to Output and Head are less than Published Figures Action 5 for data.
6	Check that negative delivery head is not occurring.	Negative delivery heads are only permissible if the pump is fitted with a snifter valve. Refer to Selwood Ltd for advice.
7	Check condition of rubber bushes in flexible coupling.	The pump is coupled to its driver by means of a pin and bush coupling. It is important that the rubber bushes should be in good condition.
8	Check that pump is not handling solids of excessive size.	If a strainer is not fitted, over-sized solids can pass into the pump. Maximum permitted size 16mm (0.62in).
9	Check condition of reciprocating and rotating parts.	The problem could be due to a loose actuator nut, or to failure of the drive shaft or eccentric bearings.

PUMP MECHANISM IS SEIZED AND CANNOT BE ROTATED BY HAND

ACTION		COMMENT
1	Check that ice has not formed in pump body.	This condition can easily arise in cold weather if the pump is stationary and has not been drained.
2	Check for over-size solids in pump body.	Absence of a strainer can lead to unacceptably large solids entering the pump and obstructing the actuators.
3	Check that drive-shaft bearings have not seized.	Bearing seizure can arise if the pump has been operated for long time periods with a failed connecting rod seal.

Refer to Selwood Ltd if the above advice does not solve your problem.

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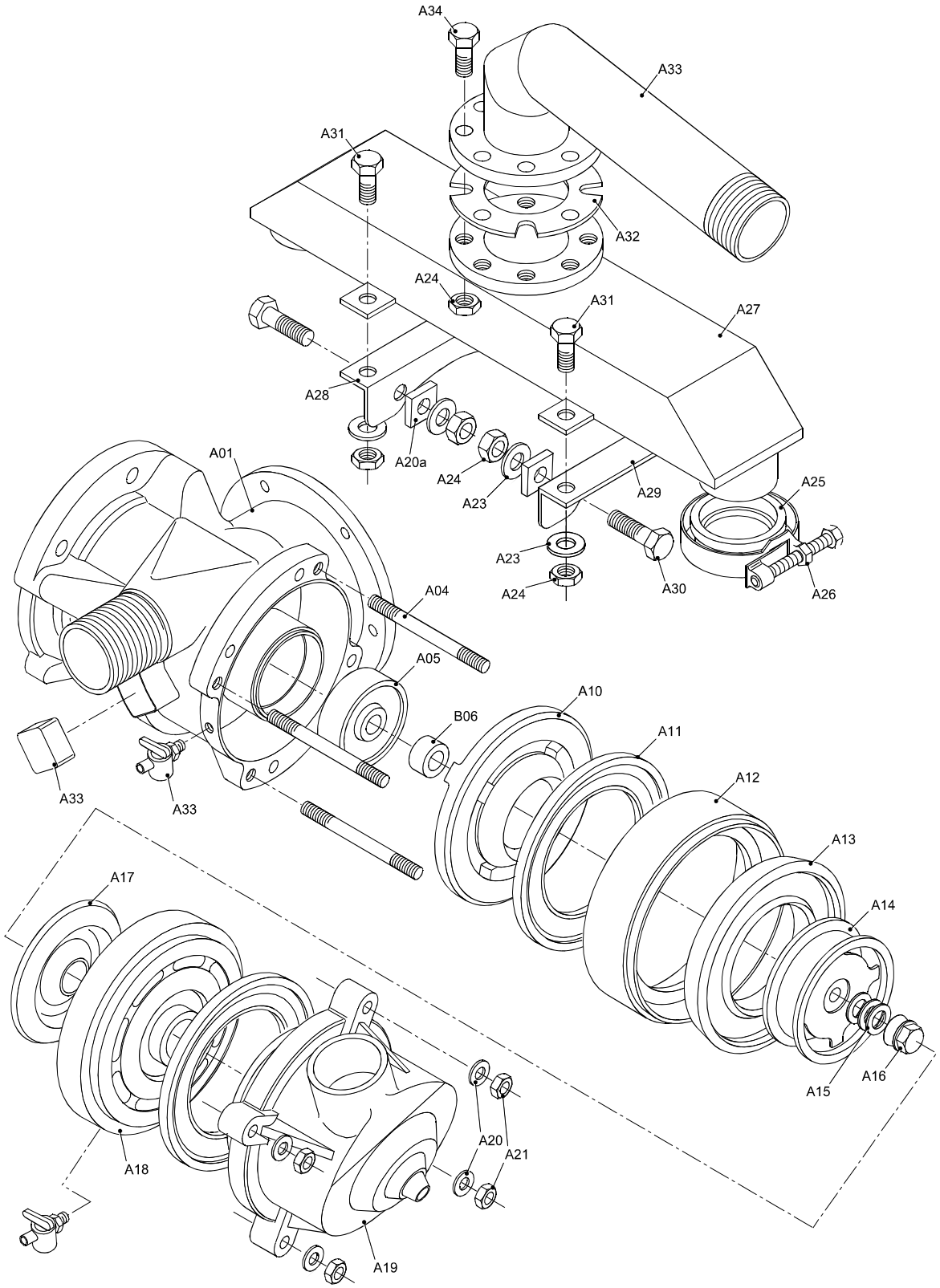
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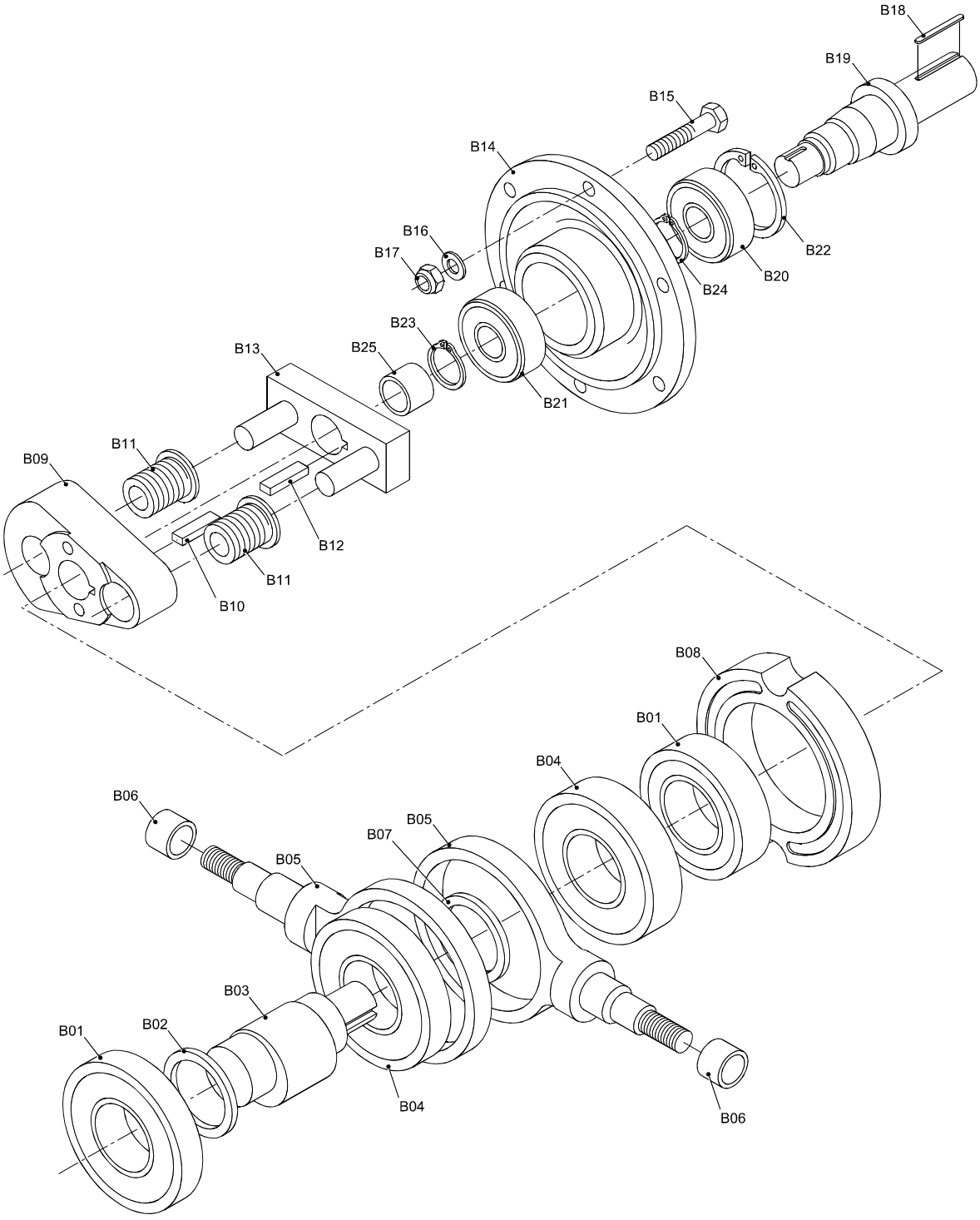
10 PARTS LIST

10.1 Pump Parts

ITEM	DESCRIPTION	PART NUMBER	QTY
A01	PD100 Body - Spigot	0004401000	1
	PD100 Body Electric - Spigot	0491026000	1
	PD100 Body - 4” BSP Female thread	0497065000	1
	PD100 Body Electric - 4” BSP Female thread	0400355000	1
A02	Drain Tap	9520003000	3
A03	Rubber Body Plug	0004447000	1
A04	Cylinder Stud	0004440000	8
A05	Connecting Rod Cylinder Seal	0004416000	2
A10	Suction Port Plate	0004415000	2
A11	Priming Annulus	0004420000	4
A12	Cylinder Body Ring	0004423000	2
A13	Actuator Seal	0004437000	2
A14	Actuator	0004419000	2
A15	Actuator Washer	9030610359	6
A16	Actuator Nut	0004422000	2
A17	Actuator Valve	0004421000	2
A18	Delivery Port Plate	0004424000	2
A19	Cylinder Head Assy	0004425000	2
A20	Flat Washer 5/8"	0004428000	8
A20a	Taper Washer	9030160306	4
A21	Cylinder Nut 5/8" BSW	0004412000	8
A23	Spring Washer 5/8"	0004433000	8
A24	Full Nut 5/8" BSF	0004430000	12
A25	Induction Connector Rubber	0004436000	2
A26	Induction Connector Selclamp	0004453000	2
A27	Flood Prime Manifold	0004414100	1
A28	Manifold Bracket L/H	0004426000	1
A29	Manifold Bracket R/H	0004427000	1
A30	Body-Manifold Bracket Bolt 5/8" BSF x 2"	0004429000	4
A31	Manifold-Manifold Bracket Bolt 5/8" BSF x 1 1/2"	0006742000	4
A32	Manifold Flange Joint	00144x9000	1
A33	Delivery Connector - Spigot	0004474000	1
	Delivery Connector - 4” BSP Male	0497062000	1
A34	Delivery Connector (Flange) Bolt 5/8" BSF x 1 3/4"	0004444000	4
B06	Connecting Rod Collar	0004482000	2

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART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B06

10.2 Drive Mechanism and Extension Drive – Shaft

From Serial No. 151

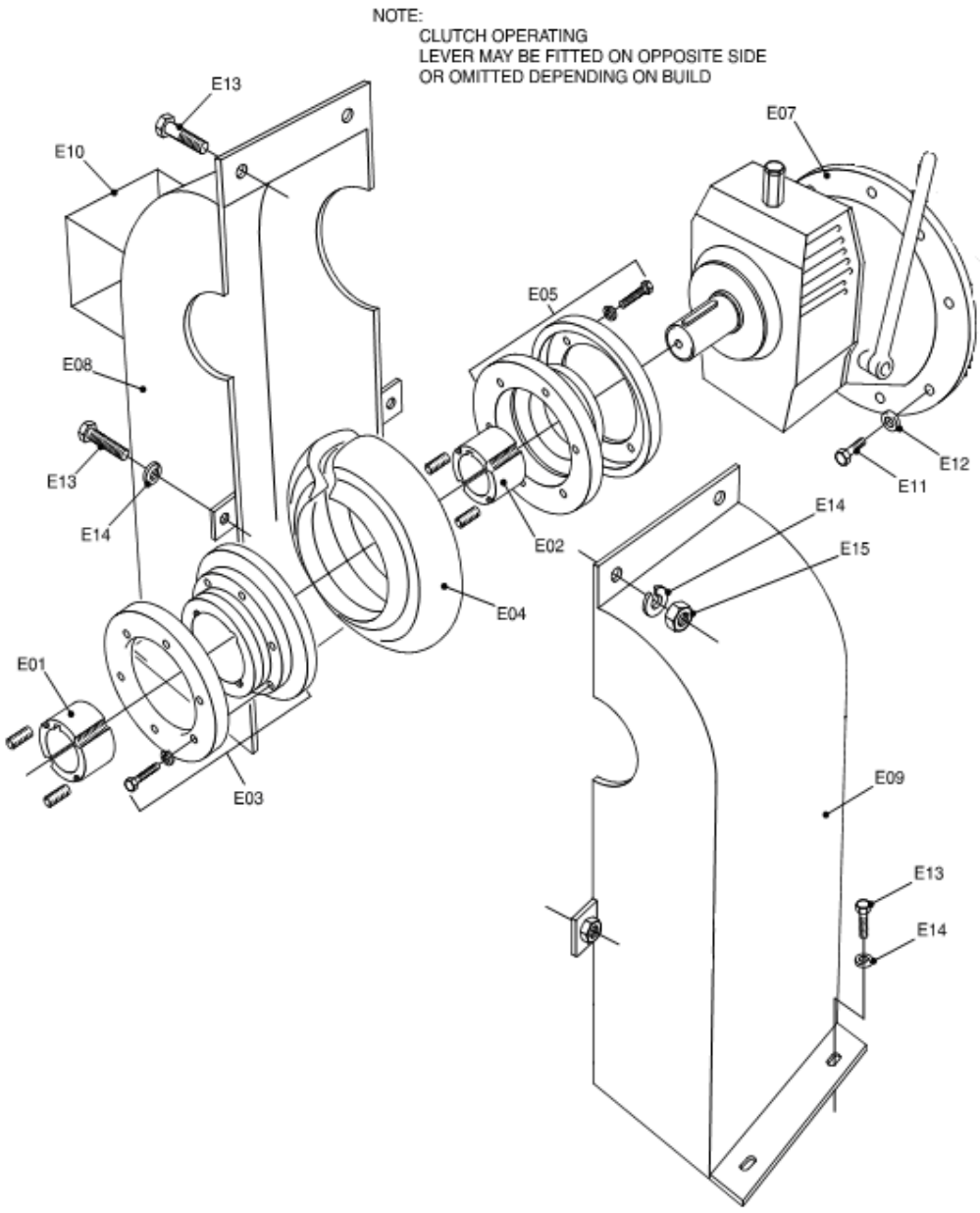
ITEM	DESCRIPTION	PART NUMBER	QTY
B01	Main Bearing	9300631332	2
B02	Main Bearing Spacer	0004498000	1
B03	Drive Shaft	0004403000	1
B04	Connecting Rod Bearing	0004404000	2
B05	Connecting Rod	0004405200	2
B06	Connecting Rod Collar	0004482000	2
B07	Connecting Rod Spacer	0004499000	1
B08	Main Bearing Housing	0004417000	1
B09	Pump Half Coupling	0004408000	1
B10	Pump Half Coupling Key 3/8" x 1/4" x 1½"	0004407000	1
B11	Coupling Rubber	0004411000	2
B12	Engine Half Coupling Key 7/16" x 9/32" x 1½"	0004418000	1
B13	Engine Half Coupling	0004406000	1
B13	Motor Coupling - (Electric Drive)	0496177000	1
B14	Bearing Housing	0004505741	1
B15	Hex. Head Bolt 7/16" BSF x 2" lg	0004491000	6
B16	Plain Washer 7/16" Dia.	0004473000	6
B17	Nyloc Nut 7/16" BSF	0004472000	2
B18	Key 10 x 8 x 56 lg (one end round)	9041105613	1
B19	Drive Shaft	0004505750	1
B20	Ball Bearing 6309-2RS	9300630932	1
B21	Ball Bearing 6208-2RS	0003204000	1
B22	Internal Circlip 100 Ø Housing	9401001001	1
B23	External Circlip 40 Ø Shaft	9401000401	1
B24	External Circlip 45 Ø Shaft	9401000450	1
B25	Coupling Spacer - (Electric Drive Only)	0496178000	1

Items B14 to B24 Extension drive shaft assembly are available as part number 0004505760 and are required with any form of external drive such as the Lister TR1 and 2:1 gearbox arrangement. These items are not fitted with Electric motor drive unless the pump is belt driven.

Item B25 coupling spacer is only used with direct drive electric motors.

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART


NOTE:
CLUTCH OPERATING
LEVER MAY BE FITTED ON OPPOSITE SIDE
OR OMITTED DEPENDING ON BUILD
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E01
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E13
E14

10.3 Coupling Assembly and Gearbox Drive Lombardini LDW702

From Serial No. 422d

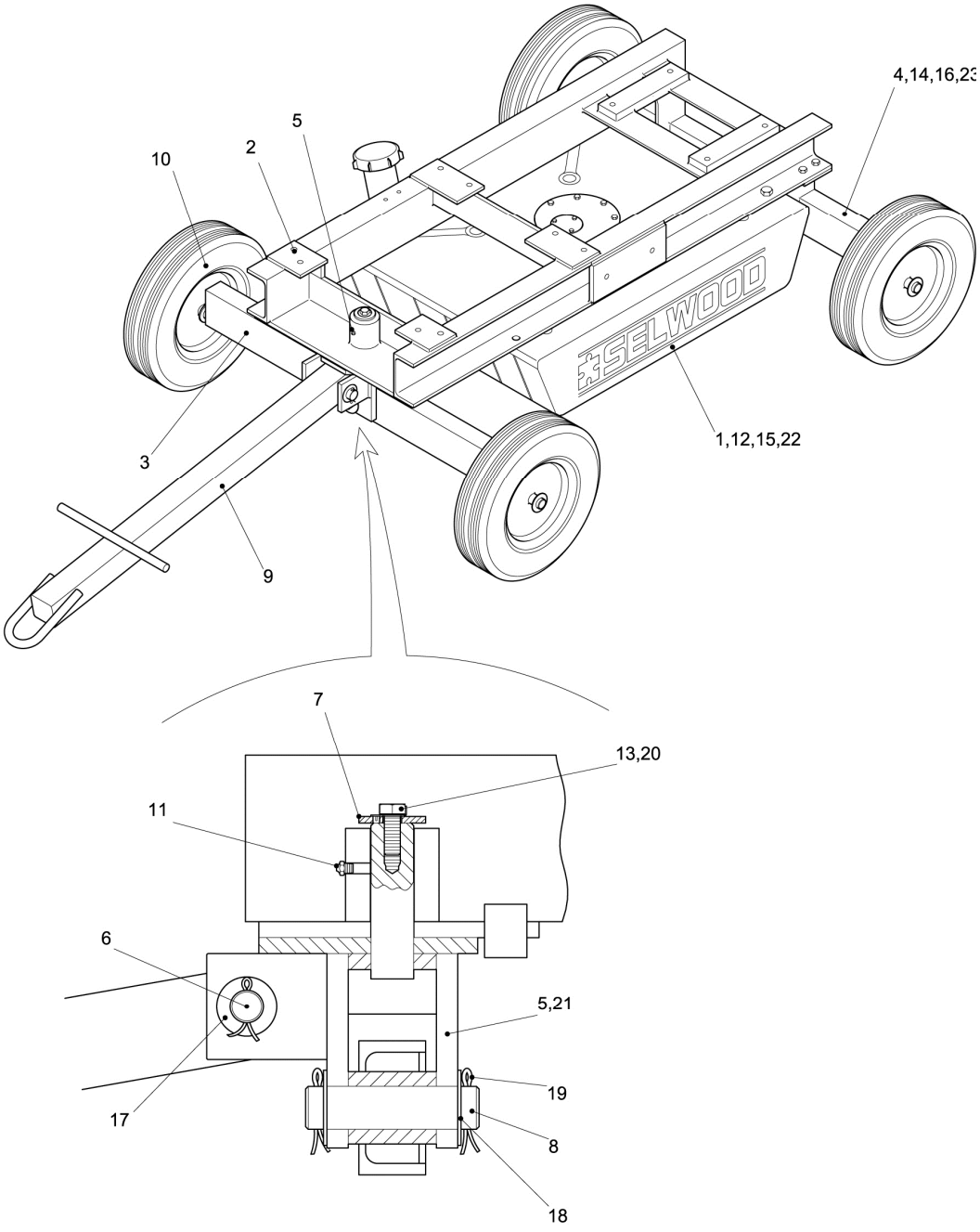
ITEM	DESCRIPTION	PART NUMBER	QTY
E01	Taperlock Bush Size 2021 38mm Dia. Bore	9631029K38	1
E02	Taperlock Bush Size 2517 30mm Dia. Bore	9631251730	1
E03	Coupling Flange Size F80 – Type F	9601080002	1
E04	Flexible Tyre Size F80 Natural Compound	9601080048	1
E05	Coupling Flange Size F80 – Type H	9601080003	1
E07	2/1 Reduction Gearbox	92611 - 0003	1
E08	Coupling Guard - RH	0406048000	1
E09	Coupling Guard - LH	0406049000	1
E11	Stud 3/8”	0003506360	8
E12	Plain Washer 3/8"	0003393000	8
E12A	Hex Self Locking Nut 3/8”BSF	0003233800	8
E13	Hex. Head Setscrew M6 x 12	9000060121	8
E14	Spring Washer M6	9030060229	8
E15	Hex. Plain Nut M6	9025060004	2

Items E01 to E05 available as an assembly Pt. No. 0010934000

** Part numbers marked with asterisks are not Selwood Part Numbers

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART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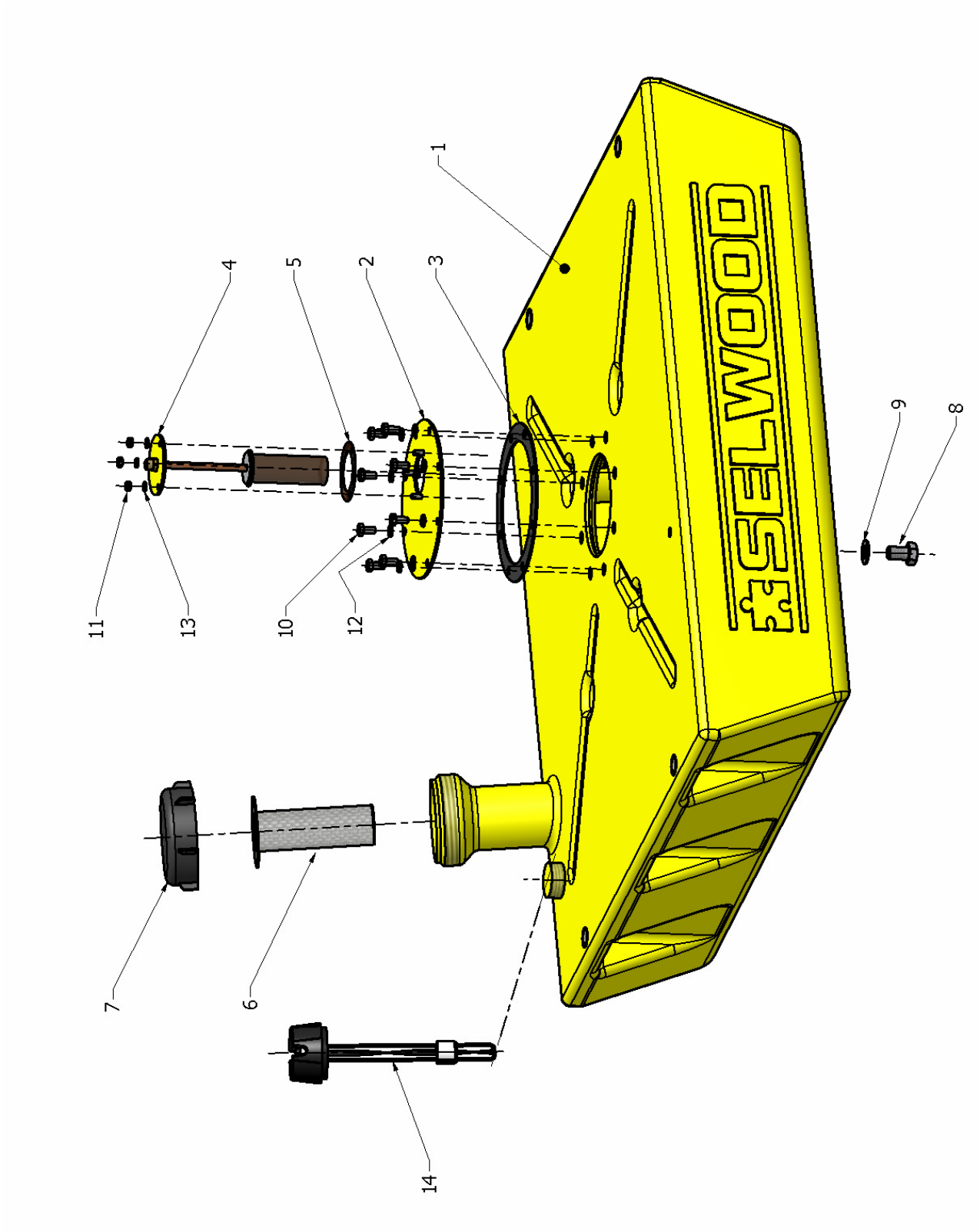
10.4 4 - Wheel Site Chassis 0406047000

ITEM	DESCRIPTION	PART NUMBER	QTY
1	Fuel Tank Assembly 105 Litre, Plastic	1502478000	1
2	Chassis Frame	0406062000	1
3	Front Axle	1502158000	1
4	Rear Axle	1502159000	1
5	Pivot	1502167000	1
6	Drawbar Pivot Pin	0015053000	1
7	Pivot Top Cap	0015054000	1
8	Axle Pivot Pin	0015055000	1
9	Drawbar	1502156000	1
10	Wheel 405 Pneumatic Tyre	9620440525	4
11	Grease Nipple (straight) 1/8” BSP	9580P00101	1
12	Hex Head Bolt M16x55 LG	9001160551	4
13	Hex Head Setscrew M12x30 LG (Wedglok)	9000120302	1
14	Hex Head Setscrew M12x35 LG	9000120351	6
15	Hex Self Locking Nut M16	9025160344	4
16	Hex Self Locking Nut M12	9025120344	6
17	Plain washer 1” Dia	0003382000	6
18	Plain washer 1¼” Dia	0006666000	2
19	Split Pin ¼” x 1¾” LG	0006667000	8
20	Plain Washer M12	9030120024	6
21	Split Roll Pin 4mm Dia x 14 LG	9042040140	1
22	Plain Washer M16	9030160024	8
23	Lock washer M12	9030120504	1

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART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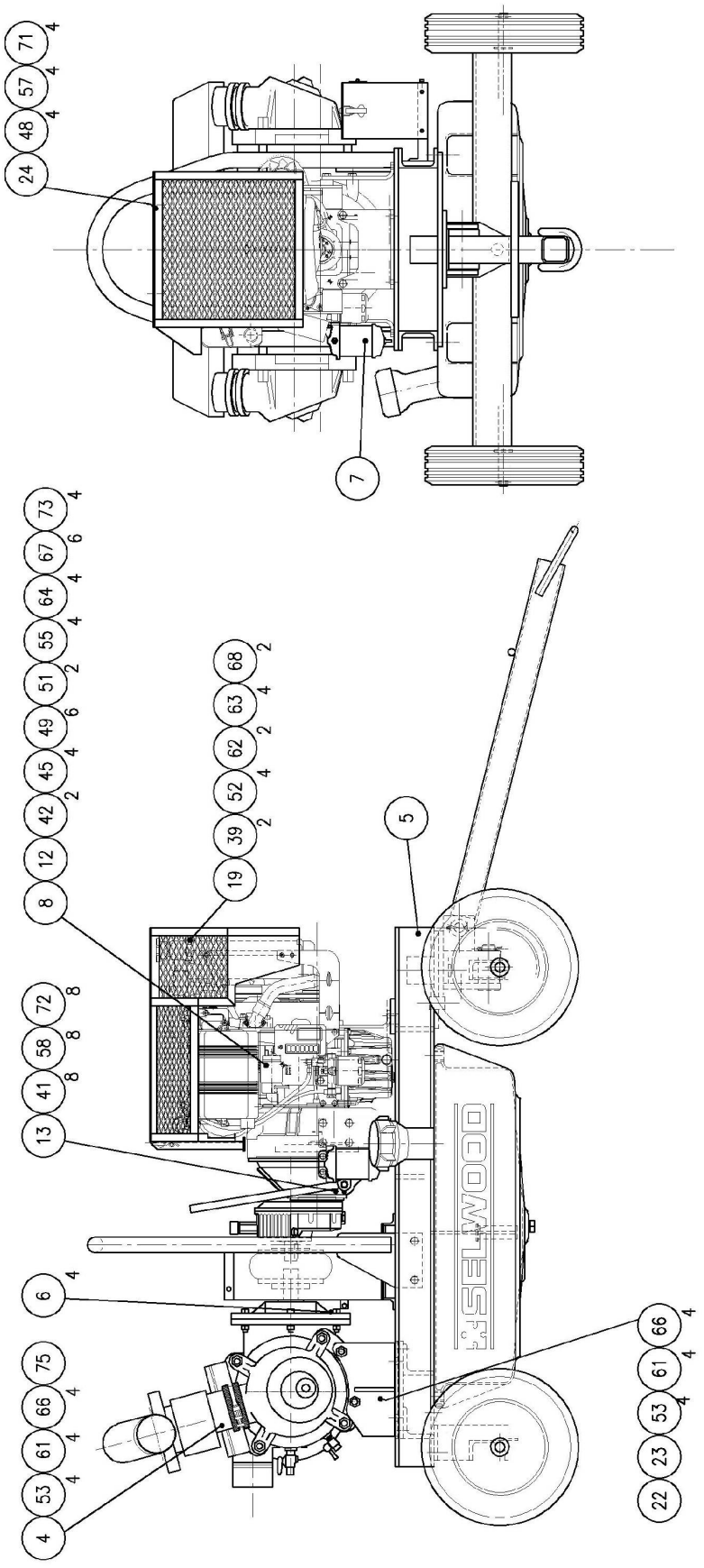
10.5 Plastic fuel tank assembly 1502478000

ITEM	DESCRIPTION	PART NUMBER	QTY
1	Plastic Fuel Tank (105 Ltr)	1502503000	1
2	Fuel Tank Inspection Cover	1503405000	1
3	Fuel Tank Inspection Cover Gasket	1503406000	1
4	Fuel Tank Feed Filter Assy	0006671000	1
5	Fuel Tank Feed Filter Gasket	0015063000	1
6	Filler Neck Filter (Plastic Tank)	1503376000	1
7	Plastic Filler Cap	9550M11503	1
8	Drain Plug, M16 x 2.00 x 25mm Long	9521M01601	1
9	Dowty Washer	9534M00301	1
10	Hex HD Setscrew M8 x 16 LG	9000080161	8
11	Hex Full Nut M6	9025060004	3
12	Spring Washer M8	9030080229	8
13	Spring Washer M6	9030060229	3
14	Fuel level contents gauge (optional)	9590K06402	1

When ordering spares, please state:
PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART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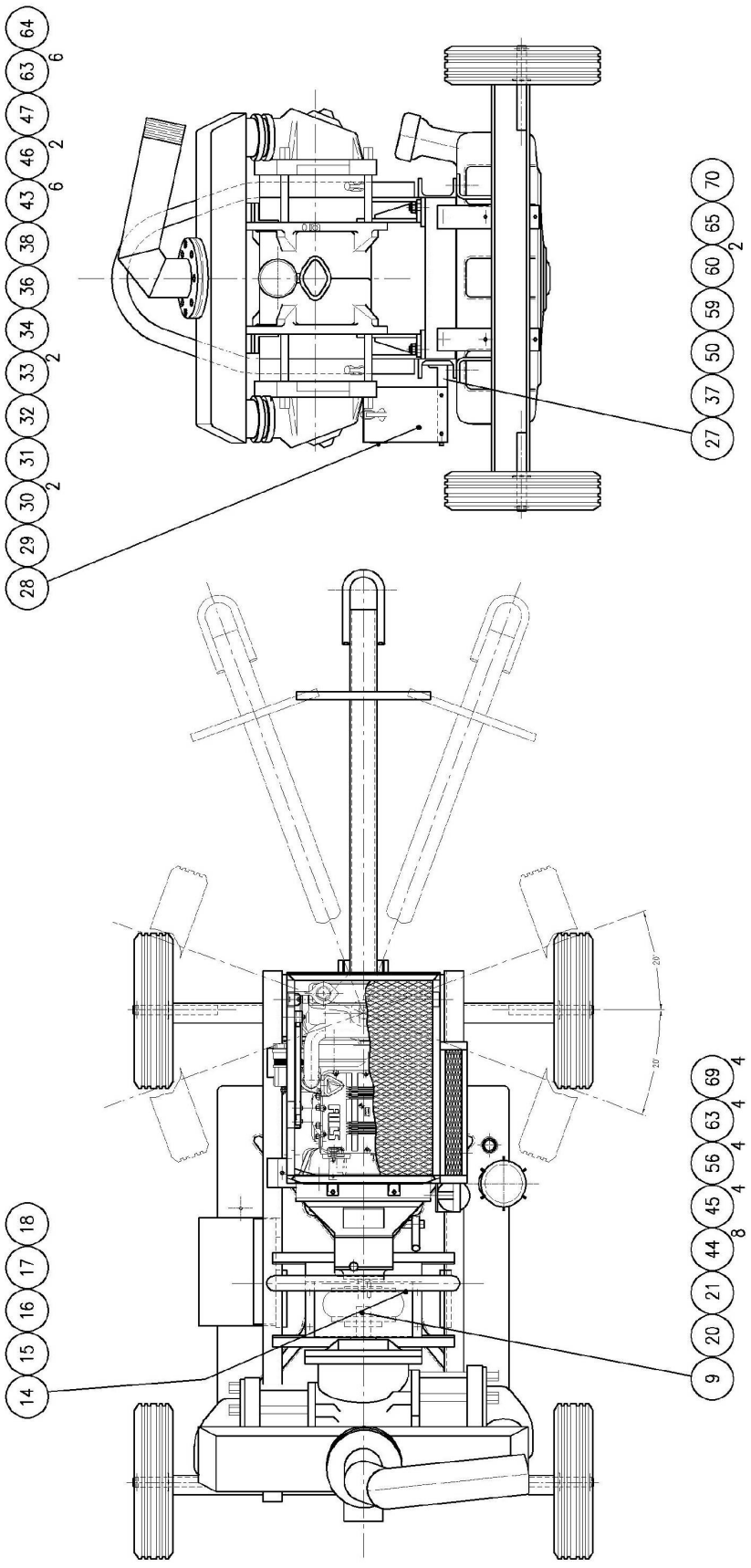
10.6 PD100/ Lombardini LDW702 Site Chassis Assy 0406055000

From Serial No. 422d

ITEM No	DESCRIPTION	PART No	QUANTITY
4	PD100 Pump Body Unit	0004940200	1
5	4 Wheel Site Chassis 105 Litre Tank	0406047000	1
6	Drive Shaft Extension	0004505760	1
7	Fuel Line – Tank To Lift Pump	0406060000	1
8	Fuel Line – Return	1092071000	1
9	Baseplate - guards	0406061000	1
12	Lombardini LDW702 Diesel Engine	92010 - 0004	1
13	PTO Gearbox RM20R – BD110\15 - i	92611 - 0003	1
14	F80 Tyre	9601080048	1
15	F80 H Flange	9601080003	1
16	F80 F Flange	9601080002	1
17	Taper Lock Bush – Code 2517 – 38 Bore	9631201238	1
18	Taper Lock Bush – Code 2012 – 30 – Bore	9631201230	1
19	Engine Guard Kit	1305265000	1
20	Coupling Guard RH	0406048000	1
21	Coupling Guard LH	0406049000	1
22	Pump Mounting Bracket	0890014000	1
23	Pump Mounting Bracket	0890015000	1
24	Lifting Eye	0406050000	1
25	Manufacture Label	0015071000	1
26	Strainer	0004435000	1
27	Battery Tray Modification	0406051000	1
28	Battery Box	0008509520	1
29	Battery 12V 40AH	9296121900	1
30	Clamp Bracket	0008509550	2
31	Battery Lead Positive	0008981000	1
32	Battery Lead Negative	1598269000	1
33	Terminal Boot	0006712000	2
34	Grommet	9705005000	1
35	Cable Tie	9705004000	2
36	Cable Clip Self Adhesive	9705003000	1
37	Battery Tray Spacer	0406052000	1
38	Blanking Grommet	9700 – 00001	1
39	Adaptor Plate	0406053000	2
40	Label – Rating Plate	1594154000	1
41	Stud 3/8”	0003506360	8

When ordering spares, please state:
PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART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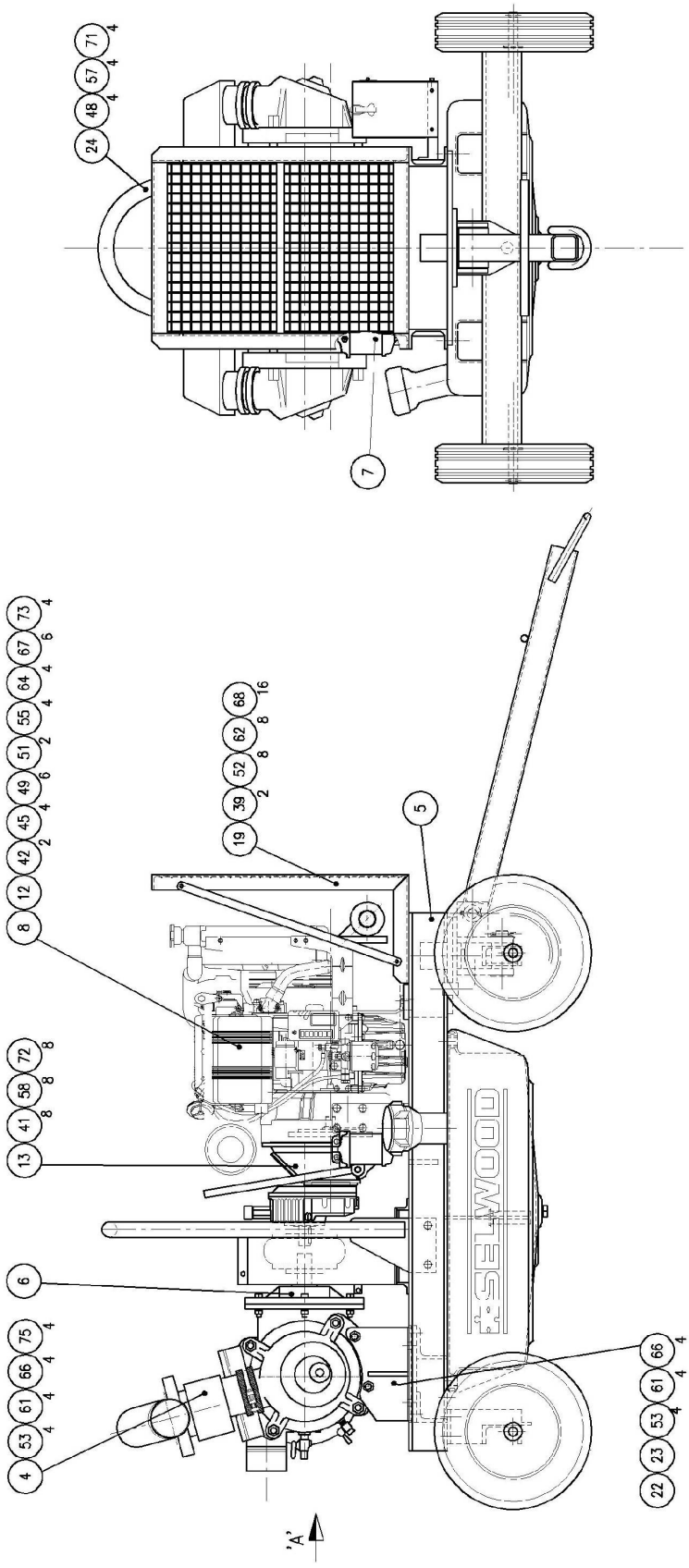
PD100/ Lombardini LDW702 Site Chassis Assy 0406055000

42	Stud M10	9001050 – 03	2
43	Socket HD Capscrew M6x8	9005060080	6
44	Hex HD Setscrew M6x12	9000060121	4
45	Hex HD Setscrew M6x20	9000060201	8
46	Hex HD Setscrew M6x25	9000060250	2
47	Hex HD Setscrew M10x16	9000100161	1
48	Hex HD Setscrew M16x45	9000160451	4
49	Hex HD Setscrew 5/16”UNCx1”	9050101001	6
50	Hex HD Setscrew M12x35	9000120351	1
51	Hex HD Bolt M10x40	9001100401	2
52	Hex HD Setscrew M8x18	9000080181	4
53	Hex HD Bolt M16x60	9001160601	8
55	Hex Self Locking Nut M10	9025100344	4
56	Hex Self Locking Nut M6	9025060344	4
57	Hex Self Locking Nut M16	9025160344	4
58	Hex Self Locking Nut 3/8”BSF	0003233800	8
59	Hex Self Locking Nut M12	9025120344	1
60	Hex Plain Nut M6	9025060004	2
61	Hex Plain Nut M16	9025160004	8
62	Hex Self Locking Nut M8	9025080344	2
63	Spring Washer M6	9030060229	14
64	Spring Washer M10	9030100229	5
65	Spring Washer M12	9030120229	1
66	Spring Washer M16	9030160229	8
67	Spring Washer 5/16”	0003396000	6
68	Spring Washer M8	9030080229	2
69	Plain Washer M6	9030060024	4
70	Plain Washer M12	9030120004	1
71	Plain Washer M16	9030160024	4
72	Plain Washer 3/8”	0003393000	8
73	Plain Washer M10	9030100024	4
74	Shakeproof Washer	0003378000	1
75	Taper Washer M16	9030160306	4
76	Hammer Drive Screw	9045002259	4

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART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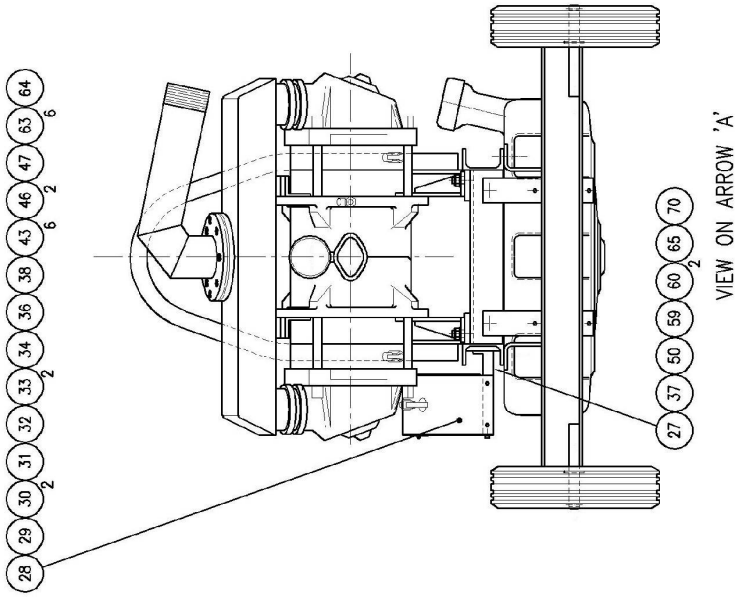
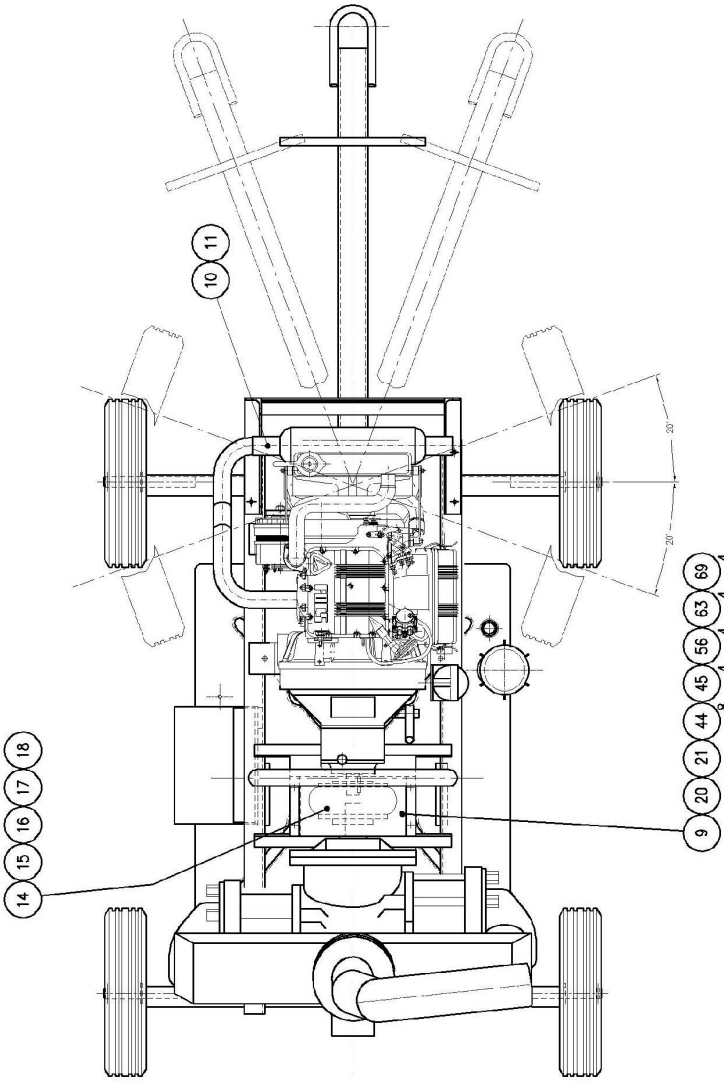
10.7 PD100/ Lombardini LDW702 Site Chassis Assy c/w Chalwyn valve and spark arrestor build No 0407340000

From Serial No. 422d

ITEM No	DESCRIPTION	PART No	QUANTITY
4	PD100 Pump Body Unit	0004940200	1
5	4 Wheel Site Chassis 105 Litre Tank	0406047000	1
6	Drive Shaft Extension	0004505760	1
7	Fuel Line – Tank To Lift Pump	0406060000	1
8	Fuel Line – Return	1092071000	1
9	Baseplate - Guards	0406061000	1
10	Ehaust heat blanket	0407341000	1
11	Lombardini LDW702 Chalwyn &Sp Arrestor kit	92700-0272	1
12	Lombardini LDW702 Diesel Engine	92010 - 0004	1
13	PTO Gearbox RM20R – BD110\15 - i	92611 - 0003	1
14	F80 Tyre	9601080048	1
15	F80 H Flange	9601080003	1
16	F80 F Flange	9601080002	1
17	Taper Lock Bush – Code 2517 – 38 Bore	9631201238	1
18	Taper Lock Bush – Code 2012 – 30 – Bore	9631201230	1
19	Radiator Guard	1305265000	1
20	Coupling Guard RH	0406048000	1
21	Coupling Guard LH	0406049000	1
22	Pump Mounting Bracket	0890014000	1
23	Pump Mounting Bracket	0890015000	1
24	Lifting Eye	0406050000	1
25	Manufacture Label	0015071000	1
26	Strainer (not illustrated)	0004435000	1
27	Battery Tray Modification	0406051000	1
28	Battery Box	0008509520	1
29	Battery 12V 40AH	9296121900	1
30	Clamp Bracket	0008509550	2
31	Battery Lead Positive	0008981000	1
32	Battery Lead Negative	1598269000	1
33	Terminal Boot	0006712000	2
34	Grommet	9705005000	1
35	Cable Tie	9705004000	2
36	Cable Clip Self Adhesive	9705003000	1
37	Battery Tray Spacer	0406052000	1
38	Blanking Grommet	9700 – 00001	1
39	Radiator tie bar	0407339000	2
40	Label – Rating Plate	1594154000	1
41	Stud 3/8”	0003506360	8

When ordering spares, please state:
PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART


VIEW ON ARROW 'A'

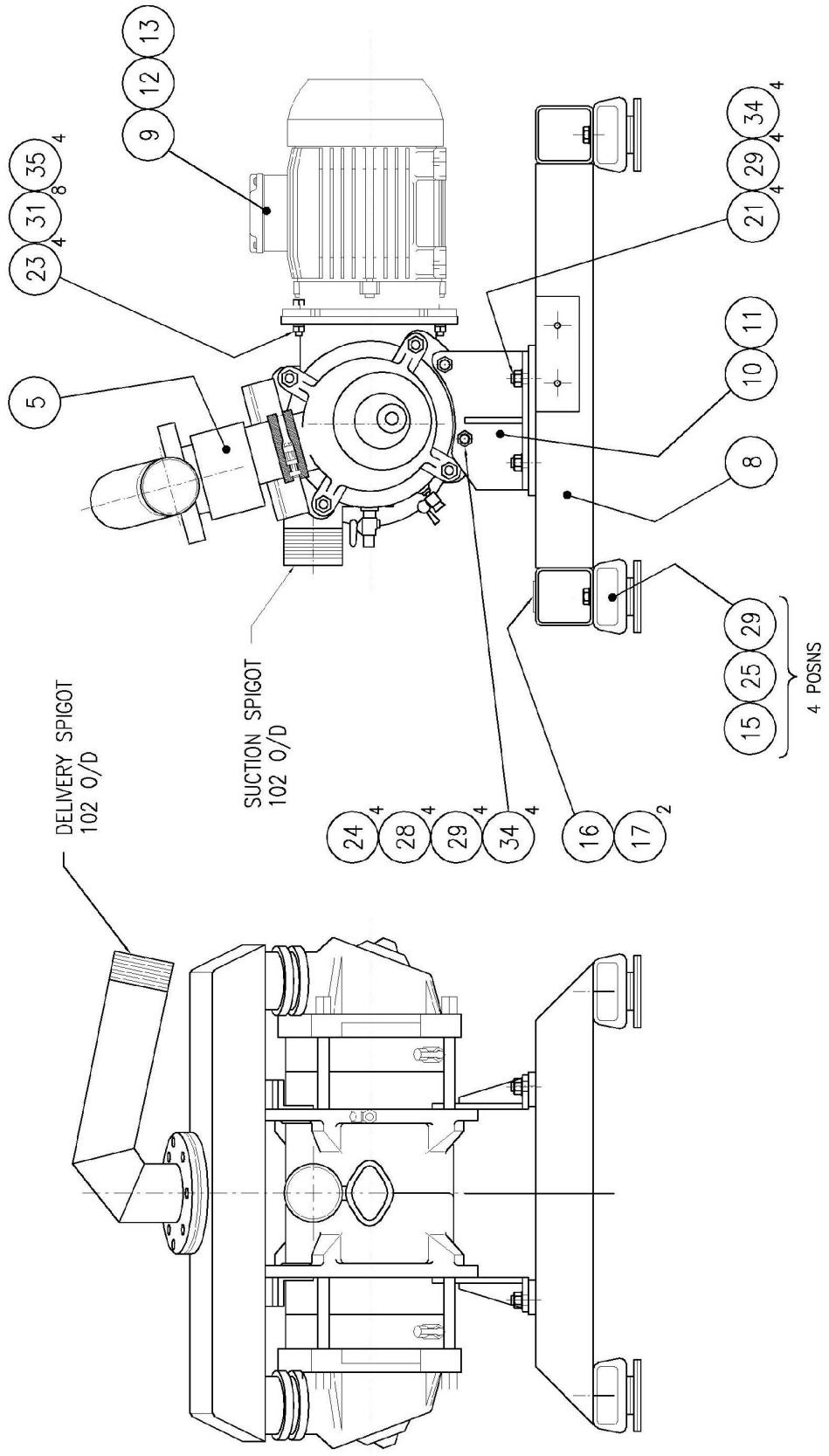


PD100/ Lombardini LDW702 Site Chassis Assy c/w Chalwyn valve and spark arrestor build No 0407340000

42	Stud M10	9001050 – 03	2
43	Socket HD Capscrew M6x8	9005060080	6
44	Hex HD Setscrew M6x12	9000060121	4
45	Hex HD Setscrew M6x20	9000060201	8
46	Hex HD Setscrew M6x25	9000060250	2
47	Hex HD Setscrew M10x16	9000100161	1
48	Hex HD Setscrew M16x45	9000160451	4
49	Hex HD Setscrew 5/16”UNCx1”	9050101001	6
50	Hex HD Setscrew M12x35	9000120351	1
51	Hex HD Bolt M10x40	9001100401	2
52	Hex HD Setscrew M8x35	9000080351	8
53	Hex HD Bolt M16x60	9001160601	8
55	Hex Self Locking Nut M10	9025100344	4
56	Hex Self Locking Nut M6	9025060344	4
57	Hex Self Locking Nut M16	9025160344	4
58	Hex Self Locking Nut 3/8”BSF	0003233800	8
59	Hex Self Locking Nut M12	9025120344	1
60	Hex Plain Nut M6	9025060004	2
61	Hex Plain Nut M16	9025160004	8
62	Hex Self Locking Nut M8	9025080344	8
63	Spring Washer M6	9030060229	10
64	Spring Washer M10	9030100229	5
65	Spring Washer M12	9030120229	1
66	Spring Washer M16	9030160229	8
67	Spring Washer 5/16”	0003396000	6
68	Plain Washer M8	9030080024	16
69	Plain Washer M6	9030060024	4
70	Plain Washer M12	9030120004	1
71	Plain Washer M16	9030160024	4
72	Plain Washer 3/8”	0003393000	8
73	Plain Washer M10	9030100024	4
74	Shakeproof Washer	0003378000	1
75	Taper Washer M16	9030160306	4
76	Hammer Drive Screw	9045002259	4

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART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102 O/D
SUCTION SPIGOT
102 O/D
24 4
28 4
29 4
34 4
16
17 2

10.8 PD100/ 5.5 KW Electric On Static Chassis Build No0496179000

ITEM No	DESCRIPTION	PART No	QUANTITY
5	PD100 Pump Unit Electric	0493057000	1
8	Electric Static Chassis	0493051000	1
9	D132M 400V/3PH/50Hz 6 Pole 1000rpm	92205 – 0003	1
10	Pump Mounting Bracket	0890014000	1
11	Pump Mounting Bracket	0890015000	1
12	PD100 Coupling Spacer	0496178000	1
13	PD100 Electric Coupling	0496177000	1
15	Anti – Vibration Mount	9680007000	4
16	Pump Identification Plate	0015071000	1
17	Hammer Drive Screw	9045002259	4
18	Rating Plate	1594154000	1
21	Stud M16	0493058000	4
23	Hex HD Bolt M12 x 45	9001120451	4
24	Hex HD Bolt M16 x 60	9001160601	4
25	Hex HD Setscrew M16 x 30	9000160301	4
28	Taper Washer M16	9030160306	4
29	Spring Washer M16	9030160229	12
31	Plain Washer M12	9030120024	8
34	Plain Nut M16	9025160004	8
35	Hex Self Locking Nut M12	9025120344	4

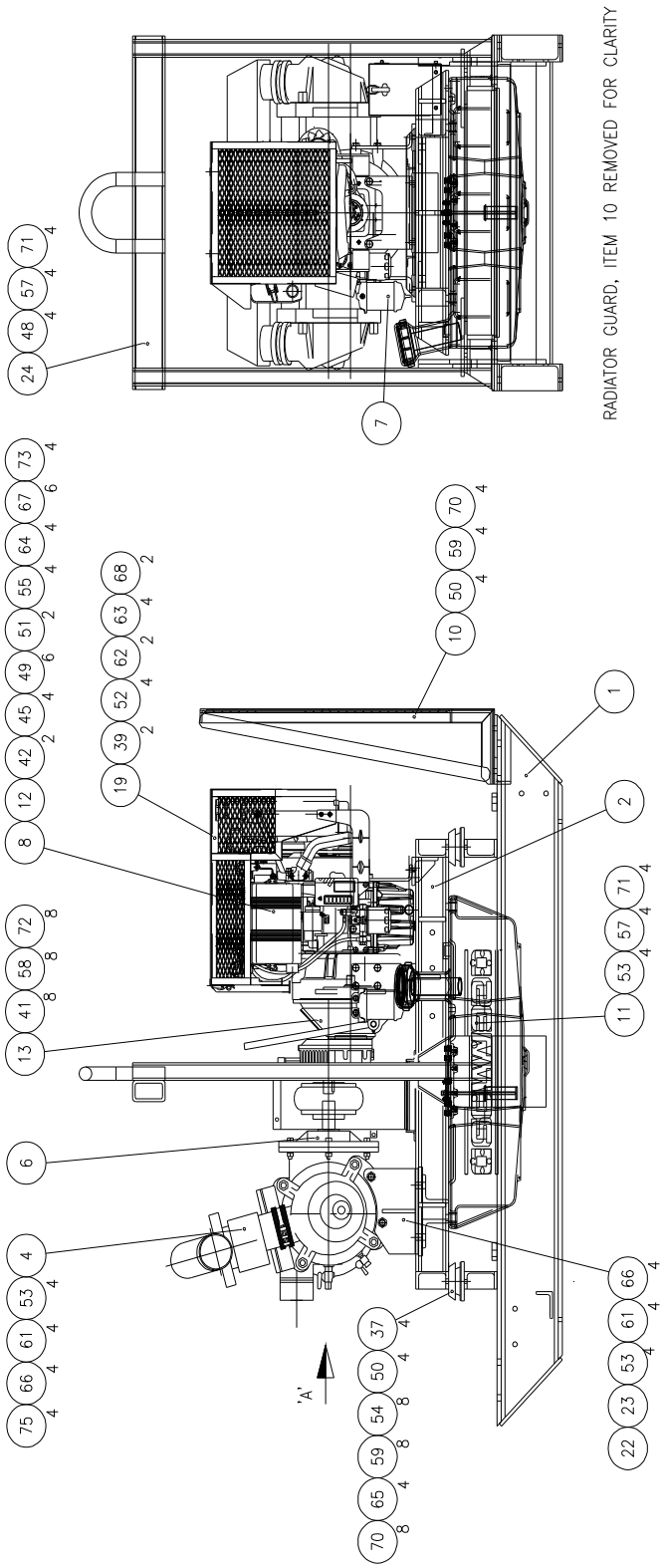
10.9 PD100/ 5.5kW Electric Site Chassis parts (NOT ILLUSTRATED) Build No 0497008000

ITEM	DESCRIPTION	PART NUMBER	QTY
8	Site Chassis Assy	0497006000	1
	Lifting Eye	0008058100	1

For all other parts see static electric and substitute site chassis for item 8 static chassis.

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART


RADIATOR GUARD, ITEM 10 REMOVED FOR CLARITY
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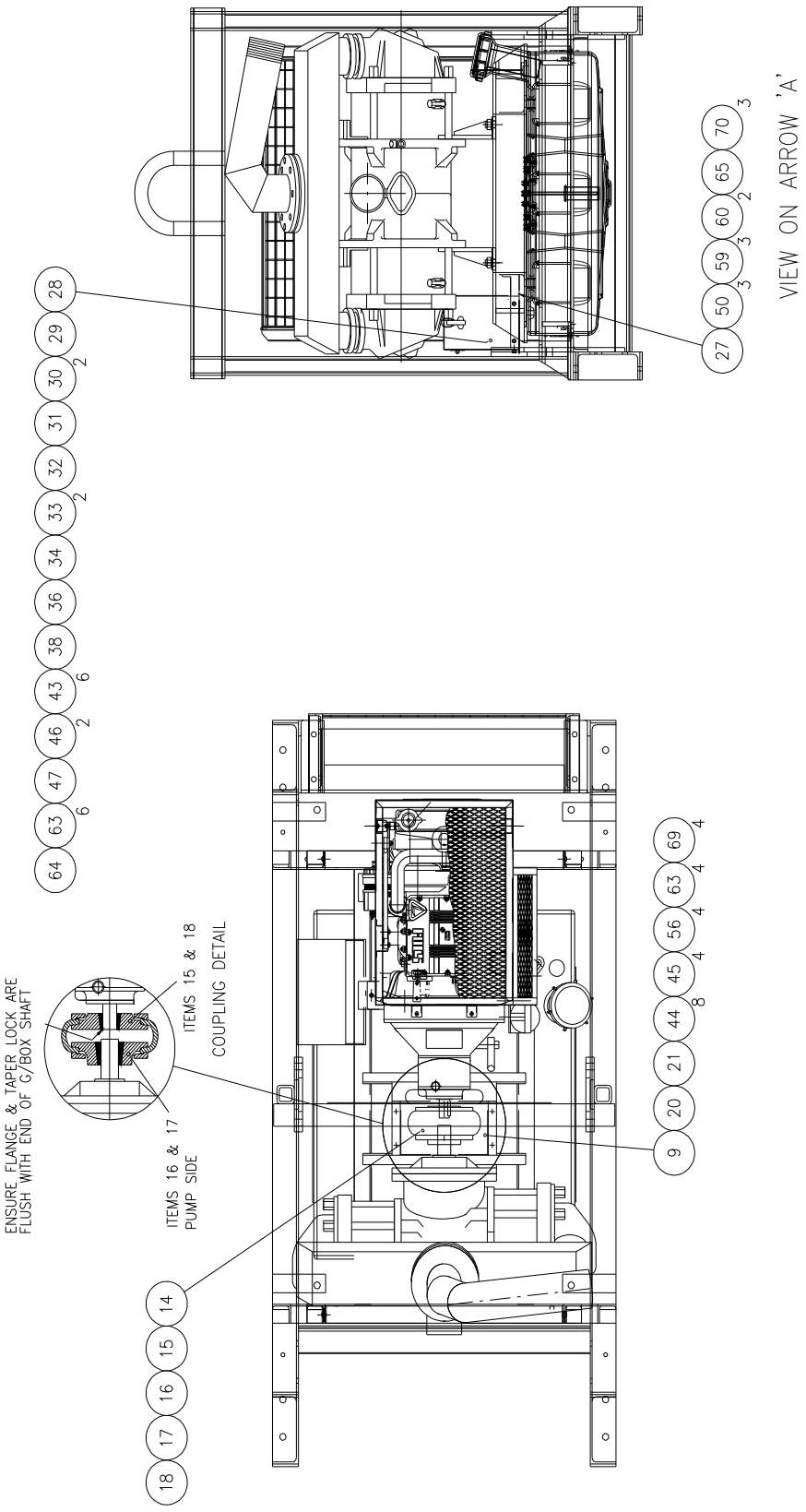
10.10 PD100/ Lombardini LDW702 Skid Chassis Assy Build No 0408265000

ITEM No	DESCRIPTION	PART No	QUANTITY
1	PD100/Lombardini Skid Base	0408254000	1
2	PD100/Lombardini Sub Chassis	0408255000	1
4	PD100 Pump Body	0004940200	1
6	Drive Shaft Extension	0004505760	1
7	Fuel Line – Tank To Lift Pump	0406060000	1
8	Fuel Line – Return	1092071000	1
9	Baseplate - guards	0406061000	1
10	Radiator Guard	1508250000	1
11	Fuel Tank Assy (105 Ltr Plastic Tank)	1502478000	1
12	Lombardini LDW702 Diesel Engine	92010 - 0004	1
13	PTO Gearbox RM20R – BD110\15 - i	92611 - 0003	1
14	F80 Tyre	9601080048	1
15	F80 H Flange	9601080003	1
16	F80 F Flange	9601080002	1
17	Taper Lock Bush – Code 2517 – 38 Bore	9631201238	1
18	Taper Lock Bush – Code 2012 – 30 – Bore	9631201230	1
19	Engine Guard Kit	1305265000	1
20	Coupling Guard RH	0406048000	1
21	Coupling Guard LH	0406049000	1
22	Pump Mounting Bracket	0890014000	1
23	Pump Mounting Bracket	0890015000	1
24	Lifting Eye	1508249000	1
25	Manufacture Label	0015071000	1
26	Strainer	0004435000	1
27	Battery Tray	0008201000	1
28	Battery Box	0008509520	1
29	Battery 12V 40AH	9296121900	1
30	Clamp Bracket	0008509550	2
31	Battery Lead Positive	0008981000	1
32	Battery Lead Negative	0008980000	1
33	Terminal Boot	0006712000	2
34	Grommet	9705005000	1
35	Cable Tie	9705004000	2
36	Cable Clip Self Adhesive	9705003000	1
37	A/V Mount	9680M00044	4
38	Blanking Grommet	9700 – 00001	1
39	Adaptor Plate	0406053000	2
40	Label – Rating Plate	1594154000	1

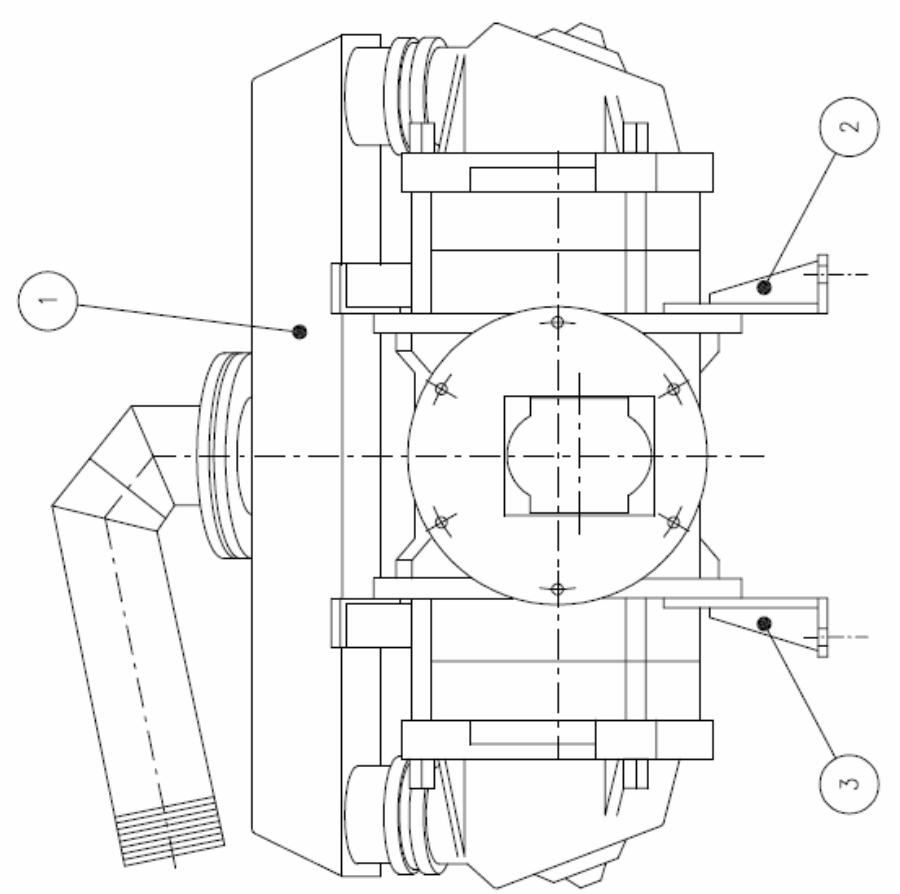

VIEW ON ARROW 'A'
ITEMS 15 & 18
COUPLING DETAIL
ENSURE FLANGE & TAPER LOCK ARE FLUSH WITH END OF G/BOX SHAFT
ITEMS 16 & 17
PUMP SIDE

PD100/ Lombardini LDW702 Skid Chassis Assy Build No 0408265000

41	Hex Hd Setscrew 3/8” UNC x 1”	0006692000	8
42	Stud M10	9001050 – 03	2
43	Socket HD Capscrew M6x8	9005060080	6
44	Hex HD Setscrew M6x12	9000060121	4
45	Hex HD Setscrew M6x20	9000060201	8
46	Hex HD Setscrew M6x25	9000060250	2
47	Hex HD Setscrew M10x16	9000100161	1
48	Hex HD Setscrew M16x45	9000160451	4
49	Hex HD Setscrew 5/16”UNCx1”	9050101001	6
50	Hex HD Setscrew M12x35	9000120351	11
51	Hex HD Bolt M10x40	9001100401	2
52	Hex HD Setscrew M8x18	9000080181	4
53	Hex HD Bolt M16x60	9001160601	12
54	Hex Hd Setscrew M12x45	9001120451	8
55	Hex Self Locking Nut M10	9025100344	4
56	Hex Self Locking Nut M6	9025060344	4
57	Hex Self Locking Nut M16	9025160344	8
58	Hex Self Locking Nut 3/8”BSF	0003233800	8
59	Hex Self Locking Nut M12	9025120344	15
60	Hex Plain Nut M6	9025060004	2
61	Hex Plain Nut M16	9025160004	8
62	Hex Self Locking Nut M8	9025080344	2
63	Spring Washer M6	9030060229	14
64	Spring Washer M10	9030100229	5
65	Spring Washer M12	9030120229	5
66	Spring Washer M16	9030160229	8
67	Spring Washer 5/16”	0003396000	6
68	Spring Washer M8	9030080229	2
69	Plain Washer M6	9030060024	4
70	Plain Washer M12	9030120004	15
71	Plain Washer M16	9030160024	8
72	Plain Washer 3/8”	0003393000	8
73	Plain Washer M10	9030100024	4
74	Shakeproof Washer	0003378000	1
75	Taper Washer M16	9030160306	4
76	Hammer Drive Screw	9045002259	4
77	Tube Sleeve 3/16”	9534027803	1
78	Enot Tube Nut	9534027903	1
79	Elbow Connector Stem Adaptor	9534M00307	1

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART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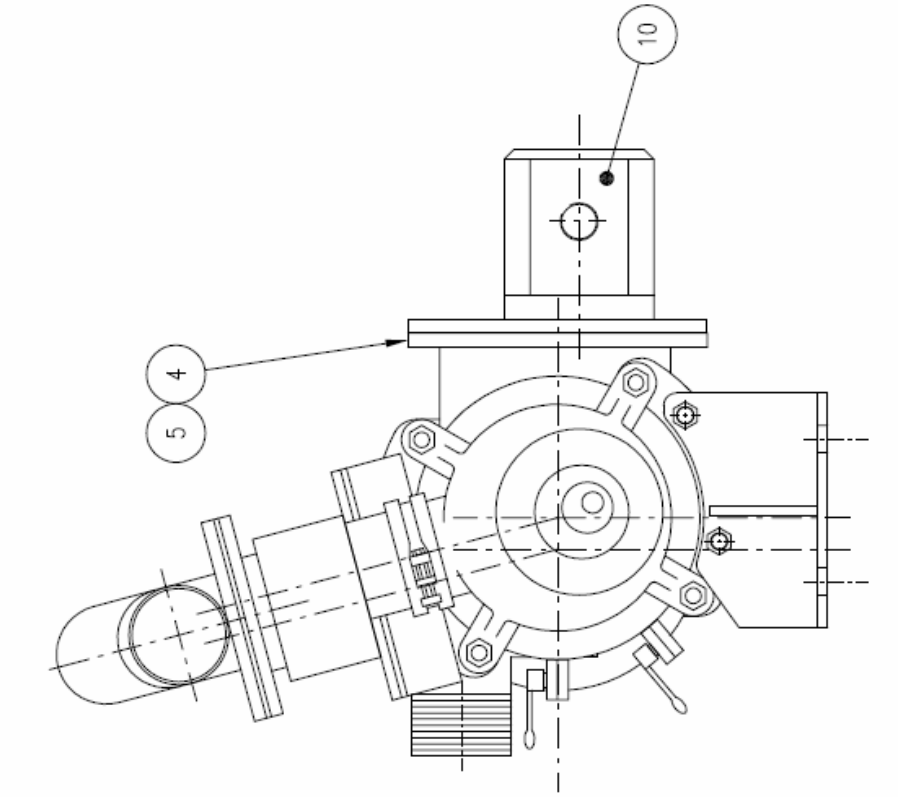
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10.11 PD100 / Hydraulic Motor – 0410293000

ITEM No	DESCRIPTION	PART No	QUANTITY
1	PD100 Body Unit	0004940200	1
2	Mounting Plate Forward	0890014000	1
3	Mounting Plate Rearward	0890015000	1
4	Adaptor Plate Hydraulic	0492170000	1
5	Drive Coupling – Hydraulic Motor	0492171000	1
10	Hydraulic Motor	92506-0001	1

When ordering spares, please state:
PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART

Hydraulic Pressure: 120 Bar.
Hydraulic Flow: 44lit/min.

11 LOMBARDINI LDW702 WIRING DIAGRAM